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R. G. WALKER, F. L. CLARKE AND G. W. DEAN

Options for Infrastructure Reporting

The article proposes a more effective system for reporting on infrastructure held by public sector agencies, having regard to the information needs of users of public sector reports, and with specific reference to concerns about inter-generational equity. It initially reviews options for accounting and reporting on the condition and value of infrastructure, and on proposed routine, overdue or deferred maintenance expenditure. A distinction is drawn between major cyclical or seasonal maintenance expenditure necessary to maintain or restore infrastructure, and projected expenditure to replace or upgrade facilities to meet higher standards of functionality or service quality. The options identified here entail combinations of asset valuations, balance sheet depictions and associated disclosures. They also encompass supplementary disclosures concerning such matters as physical condition, asset management plans, and contractual commitments to perform maintenance or other works. Most embody assumptions about the future use of infrastructure.

An assessment of those options suggests that the optimal mode of reporting would not involve 'recognition' of deferred maintenance as a liability, as a contra asset or as a component of equity (the treatments frequently advocated). Rather, it would involve a package of supplementary financial and non-financial disclosures—with the latter incorporating a combination of descriptive information and condition ratings for assets of differing economic lives, and statements of assumptions about future asset use. Possibly these disclosures could be augmented by disclosures of proposed or projected cash flows on future maintenance and upgrading work.

Key words: Condition assessment; Cyclical maintenance; Deferred maintenance; Infrastructure; Infrastructure reporting; Public sector.

Claims abound that many governments throughout the world are facing problems in funding the repair, restoration, maintenance, replacement or upgrading of infrastructure (New South Wales [N.S.W.] Public Accounts Committee, 1983; South Australian [S.A.] Public Accounts Committee, 1987, 1988; House of Representatives Committee on Transport, Communications and Infrastructure [HRCTCI], 1987; National Council on Public Works Improvement, 1988; Canadian Institute of Chartered Accountants [CICA], 1989; Poggemeyer, 1989; Wieman, 1993; Quimpo

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and Wu, 1997; Federal Accounting Standards Advisory Board [FASAB], 1998). It has been widely recognized that the scale of public sector investment in infrastructure is substantial (see, e.g., Neutze, 1997). Indeed, Australia's Economic Planning Advisory Commission has suggested that government 'owns around 90 per cent of infrastructure assets' (EPAC, 1995, p. ix). It is also widely recognized that expenditure on infrastructure maintenance can be a material component of public sector expenditure (e.g., CICA, 1989; International Federation of Accountants [IFAC], 1998).

For many public sector agencies, the condition of the infrastructure they manage is a key indicator of operational performance. In recent years this has been highlighted by the failure of some infrastructure systems, at times leading to injuries or fatalities, and widespread disruption to the community before services are restored. Yet until recently little attention has been devoted to the myriad ways of reporting on infrastructure, specifically reporting on the 'condition' of infrastructure, or on quantifying and reporting deferred maintenance.

This article is preliminary, descriptive and speculative. While examining international issues, the major evidence is Australian. The article examines existing and proposed methods of accounting or reporting on the condition and the associated value of (physical) infrastructure—with particular reference to the use of 'provisions' to record sums likely to be spent on routine, cyclical, major or deferred maintenance. It then explores how public sector stakeholders might be *better informed* about critical financial and other characteristics of public sector assets—especially concerning how governments have maintained (or propose to maintain) infrastructure and the assessed needs for future expenditure on deferred and major cyclical maintenance, or the upgrading or replacement of existing assets.

A motivation for the article is the belief that much of the work of standard-setting or other regulatory bodies in dealing with infrastructure reporting has been misdirected. Many of the arguments about infrastructure reporting have emphasized concepts set forth in a conceptual framework, rather than systematically considering what *information about infrastructure is likely to be relevant to users of reports*. As a result there has been a tendency to propose that accrual accounting resulting in reporting dollar values in accounts would meet the needs of users, when more detailed analysis suggests that those needs require a combination of financial data and non-financial quantitative and qualitative information.

It is acknowledged that many private sector firms also have major investments in infrastructure—notably firms engaged in the mining, electricity generation and distribution, telecommunications, water treatment or tollroads industries. This is becoming even more so as a consequence of the corporatization and privatization of many public sector enterprises. Hence many of the issues examined in this article are also of relevance to private sector financial reporting. However, the attention here on public sector agencies enables the specification of a particular context within which characteristics of information about infrastructure can be evaluated. Further, much of the initial capital of government authorities and agencies is funded through loan finance, and it may be considered that loan repayments (if they correspond to the life of the assets acquired with that capital) should be made by the generations *benefiting* from the service. However this outcome will not be achieved without consideration of the whole-of-life expenditure on asset maintenance. Thus, a concern with inter-generational equity suggests a need to look beyond the timing of the repayment of financial obligations. To date, articles addressing inter-generational accounting issues (e.g., Auerbach *et al.*, 1994; Haveman, 1994) appear to be misdirected. They have failed to link the need for non-financial asset condition information about infrastructure with information about current and long-term future financial information about the value and obligations associated with infrastructure.

Two prior articles by the current authors have analysed matters related to issues in reporting on infrastructure in Australia (Walker *et al.*, 1999, 2000). The former article reviewed experience with innovative disclosure rules imposed on N.S.W. local government. These rules required councils to report to the Minister for Local Government on the condition of public works, provide an estimate of the amount of money required as at the end of the reporting period to bring the works to a 'satisfactory condition', provide an estimate of the annual expense of maintaining the works to that standard, and the budgeted expenditure for the forthcoming year on maintenance of those assets. Local councils were found to have identified significant amounts of either deferred maintenance expenditure or projected expenditure on proposed infrastructure upgrading. The article highlighted the ambiguity of the legislative test of 'satisfactory condition' and the way that local councils, in reporting on these matters, had presented confusing estimates which combined projections of basic maintenance expenditures with calculations of forecast expenditure on upgrading the functionality of infrastructure assets to varying standards.

The second article (Walker *et al.*, 2000) drew on five years' experience with the Australian application of competing forms of valuation based on replacement prices in the public sector. It provided evidence of the inability of CCA operating profit (using deprival or optimized deprival values of assets) to deliver consistently prepared financial data which were serviceable for valid cross-sectional and longitudinal comparisons of the financial performance of selected public utilities.

It is noted that, consistent with the move toward a common accrual accounting conceptual framework and standards, public sector infrastructure and related deferred maintenance reporting and accounting practices have generally followed private sector approaches for recording long-lived physical assets in financial statements, but with a greater emphasis on the use of variants of 'current cost accounting' as the basis for asset valuation. The present article draws on the findings from Walker *et al.* (1999, 2000), to analyse a wider range of options for the reporting on public sector infrastructure.

TERMINOLOGY

Infrastructure is generally defined either by describing its common features or by listing examples (see, e.g., Van Daniker and Kwiatkowski, 1986; N.S.W. Department of Local Government, 1996a, 1996b; Pallot, 1997). For example, it has been suggested that infrastructure represents 'facilities that provide essential services and enhance the productive capacity of the economy', and includes items such as: pipes, roads, bridges, drains, railroads, power generation plants and transmission lines, police stations, courthouses, schools, hospitals, other government buildings, parks and gardens, playing fields, footpaths, kerbing and guttering, pavements, sea-walls, levee banks, other major public works, water and sewerage systems including underground (N.S.W. Department of Local Government, 1996a, p. 6001). In that context infrastructure is perceived to be virtually everything put to the service of the public in general—a heterogeneous collection of physical and environmental facilities, with their acquisition and maintenance funding from the public purse the only element in common.

Key terms used in debates about accounting or reporting on infrastructure concern the concepts of 'maintenance' and 'deferred maintenance', and the distinction between 'capital' and 'maintenance' expenditure. The latter distinction may involve recourse to whether expenditure involves restoring, maintaining, replacing or upgrading system functionality. There appears to be acceptance in the professional accounting literature that projected expenditure on 'capital' items is not to be regarded as constituting a liability.

Maintenance expenditures may result from either planned periodic (often cyclical or seasonal) maintenance programs, or from the deferral of routine maintenance. There is debate about whether proposed maintenance expenditure should be *disclosed* in the accounts, and whether it should be *recognized* as a provision (to be displayed either as a 'liability' or a deduction from reported asset values).

Regarding 'deferred maintenance' and 'maintenance' generally, the U.S.A.'s FASAB has noted:

> 77. Deferred maintenance is maintenance that was not performed when it should have been or was scheduled to and, which therefore was put off or delayed for a future period. 78. ... maintenance ... the act of keeping fixed assets in acceptable condition ... includes preventive maintenance, normal repairs, replacement of parts, and structural components, and other activities needed to preserve the asset so that it continues to provide acceptable services and achieves its expected life ... excludes activities aimed at expanding the capacity of an asset or otherwise upgrading it to serve different needs from, or sufficiently greater than, those originally intended. (FASAB, 1985)

REPORTING OPTIONS

Numerous options (not necessarily exclusive) have been proposed for accounting or reporting on the value and condition of infrastructure and the treatment of past or proposed expenditures to restore, maintain or upgrade infrastructure. This section outlines those options. The following sections summarize them and provide an assessment of each option (and some variations) in terms of their capacity to present information which is relevant to the major judgments likely to be made by users of public sector financial reports.

Provision for Major Cyclical Maintenance

As its label implies, major 'cyclical' maintenance arises from cyclical or seasonal maintenance programs, undertaken periodically and deliberately to ensure that the asset (or network) continues to provide the service potential it originally possessed when acquired or constructed. Public sector examples of such expenditure include re-sheeting roads, patching buildings and recoating or relining pipes. Such anticipated 'lumpy' or 'cyclical' expenditure may be reported by creating a provision for 'major cyclical maintenance' in addition to routine annual charges for depreciation intended to reflect the loss of service potential from ongoing operations. Without major cyclical maintenance, the asset or network would not be restored to its designed service potential because of its materially shorter useful life.

In most Australian states, it is reported that public sector entities 'generally only recognize maintenance expenses when the maintenance work is undertaken' (AARF UIG, 1998, p. 1). However, the 1996 N.S.W. *Local Government Asset Accounting Manual* required that:

> where major cyclical maintenance is scheduled (in accordance with a maintenance program) over a number of reporting periods of maintenance, its reporting is to be deferred to future reporting periods. The depreciation expense recognized during each reporting period until the maintenance is performed is to take into account the consumption or loss of service potential or future economic benefits. When the cyclical maintenance is carried out, the accumulated depreciation is to be adjusted by the amount of the cost of the restoration. Expenditure in excess of the [cumulative] amounts that have been charged as depreciation or provision for major periodic maintenance expense are to be reported as a maintenance expense in that period. (N.S.W. Department of Local Government, 1996b, p. 902)

Thus, contrary to the UIG's observation, the above prescribed process of charging the restoration expenditure against depreciation and providing for major period maintenance would ensure that an expense would be recorded before cash was outlaid.

However, the *Manual*'s approach will change due to AARF UIG Abstract 26 (June 1999a), which proscribes the recording of a provision for future maintenance as a liability, or as an accumulated depreciation, or as a reduction in the carrying amount of an asset. The N.S.W. Treasury, which earlier had required the establishment of a provision for major periodic maintenance in the accounts of general government or public trading enterprises (N.S.W. Treasury Circular 94/1, 1994b), subsequently withdrew that directive (N.S.W. Treasury Circular 99/08, 1999).

Provision for Deferred Maintenance

Deferred maintenance 'refers to the difference between expenditures required to maintain the normal operating capacity of the network of assets or infrastructure and any lesser amount of maintenance and replacement expenditure actually incurred' (CICA, 1989). Budget constraints or other managerial decisions may lead to delays in implementing cyclical or seasonal maintenance or deferral may be compelled by climatic conditions or catastrophic events. Whatever the cause, deferring maintenance is a major problem for public sector agencies (CICA, 1989, p. 60; IFAC, 1998, p. 18).

As with major cyclical maintenance, for decades it had been possible for deferred expenditure to be reported by creating a 'provision for deferred maintenance' generally in addition to routine charges for depreciation. Clearly, such a practice will affect the accumulated reported asset and equity balance sheet elements of public sector entities and their annual reported profits.

While not acknowledged in the current professional deliberations, several older authoritative texts discuss the concept of deferred maintenance expenditure. Numerous themes are evident—namely: (a) concern as to whether such provisions are 'reliable'; (b) an emphasis on expenditure needed to maintain and not upgrade functionality; and (c) debate over whether those expenditures should appear as a 'provision' or 'reserve' (Dicksee, 1892, 1910; Dawson, 1908; Paton, 1932, 1947). It is not clear whether the proposals for some recognition of deferred maintenance, as outlined in these texts, were actually applied in practice. In the 1990s, several authors produced reference volumes on the meaning of accounting concepts (Chambers, 1996; Chatfield and Vangermeesch, 1996; Abdel-Khalik, 1997), but none of these referred directly to 'deferred maintenance'.

Recently IFAC (1998) has noted that 'deferred maintenance of PP&E [property, plant and equipment] is an economic cost for both the private sector and the government. However, because there is not a liability, which meets present recognition and measurement criteria, deferred maintenance is not generally recognized in either sector.' It went further, stating that:

> when a generally accepted method of measurement and related maintenance standards such as the definition of 'acceptable condition' [say fair, or perhaps 3 on a 1–5 scale] are developed, United States standard setters plan to consider requiring the recognition of deferred maintenance costs'. (IFAC, 1998, p. 18)

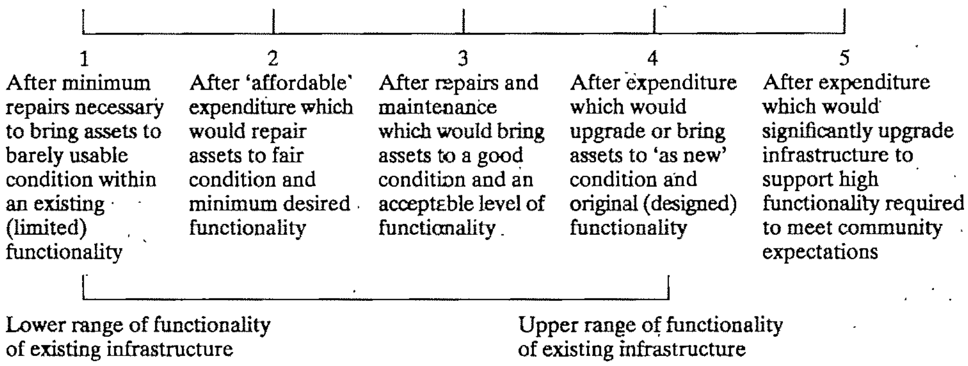
As noted above, whereas 'deferred maintenance' typically has referred to expenditure required to bring an asset to some 'required, often implicitly existing, service potential' (Pallot, 1997), it also has been used to refer to expenditures to *upgrade* service potential (Walker *et al.*, 1999). In the latter context the question emerges, should there be recognition in the accounts of planned expenditures to say (a) improve street lighting over high-risk pedestrian crossings? or (b) upgrade water treatment plants to meet higher health standards? Arguably since those expenditures would add to the functionality of existing assets, they would be *capital* expenditures, rather than periodic operating charges against revenues. On the other hand, if governments or other bodies have established minimum standards for street lighting or water quality, such expenditure could be claimed to be non-discretionary (and hence be regarded as an 'obligation'). It is acknowledged that plans for future expenditure may be of interest to stakeholders. However, the use of provisions to adjust reported asset values because of such plans is quite inconsistent with other forms of accounting for and reporting on non-current assets.

After reviewing N.S.W. local government reporting practices in interpreting statutory requirements to report expenditure required to bring infrastructure assets to a 'satisfactory condition', Walker *et al.* (1999) identified five concepts of functionality (see Figure 1).

These different concepts lead to different interpretations of what could be considered to be 'deferred maintenance'.

FIGURE 1

INTERPRETATIONS OF 'SATISFACTORY CONDITION'


1
After minimum repairs necessary to bring assets to barely usable condition within an existing (limited) functionality
2
After 'affordable' expenditure which would repair assets to fair condition and minimum desired functionality
3
After repairs and maintenance which would bring assets to a good condition and an acceptable level of functionality
4
After expenditure which would upgrade or bring assets to 'as new' condition and original (designed) functionality
5
After expenditure which would significantly upgrade infrastructure to support high functionality required to meet community expectations
Lower range of functionality of existing infrastructure
Upper range of functionality of existing infrastructure

Source: Walker *et al.* (1999)

'Reserves' for Renewals or Asset Replacement (Reported as Part of Equity)

A distinction between 'reserves' and 'provisions' has featured in early handbooks on accounting (e.g., Paton, 1932) and in many early authoritative statements issued by the accounting profession, including The Institute of Chartered Accountants in England and Wales' 1943 'Recommendations' (ICAEW, 1943) and the virtually identical 1946 recommendations issued by The Institute of Chartered Accountants in Australia (ICAA, 1946a). In both documents, the term 'provision' was used to denote diminutions in the value of assets as at the date of the balance sheet 'where the amounts involved cannot be determined with substantial accuracy'. A provision could also be used 'to denote amounts set aside to meet specific commitments and contingencies the amounts of which cannot be determined with substantial accuracy' (ICAEW, 1943; ICAA, 1946a, para. 19). While failing to contrast the notions of *renewals* and *replacement*, the ICAA Recommendations further envisaged the use of 'reserves' in the form of 'provisions for renewals' to record amounts set aside for the replacement of assets.

> Where the replacement of fixed assets is dealt with by making a provision for renewals and charging the cost of replacement against the provision so made, the accumulated amount of provision for renewals, so far as not used, should be shown separately. Such a provision should not be shown as a deduction from the assets . . . (para. 20)
>
> Where depreciation is provided on fixed assets, an amount set aside in recognition of the increased cost expected to be incurred in replacing fixed assets, as compared with the amount at which they are carried in the books, is not a 'provision'; it is a reserve and should be shown as such . . . (para. 21)
>
> Where any amount written off or retained to provide for depreciation or diminution in value of assets, or retained to provide for any known or anticipated liability, is materially in excess of that which is reasonably necessary for the purpose, the excess shall be treated as a reserve. (para. 22)

Similarly, ICAEW (1943) and later ICAA (1946b) made passing reference to the possibility that entities may choose to set aside funds for asset replacement. These were matters of 'financial prudence'.[1] The sums required could not be estimated 'with any degree of accuracy', and the amounts recorded in the accounts were 'in the nature of reserves and should be treated as such in the accounts'—that is, as part of owner's equity.

The encouragement for the use of 'provisions for renewals' was repeated in later statements issued by the ICAA (e.g., Statement on Accounting Practice D1.1, 1979).

Renewals Accounting

Renewals accounting has been defined as a

> method of accounting for fixed assets that are intended to be maintained indefinitely whereby depreciation charges are replaced with charges in an amount that provides an allowance for renewals equal to the present value of the renewal expenditure needed over a reasonable planning period to bring the fixed assets up to a defined standard of service and repair to maintain them at that standard. (CICA, 1989, p. 102)

Renewals accounting involves the creation of 'provisions for renewals'. But, unlike the practices contemplated by the 1940s ICAEW and ICAA Recommendations, renewals accounting also involves a specific notion of assets. Rather than separately identifying individual physical assets (such as a building, a ship, a dam or a pipe) renewals accounting identifies an entire network or system as an asset. CICA (1989) noted that this method is based on the assumption that large infrastructure systems tend to mature to a steady state where the annual cost of appropriate maintenance and renewals of the network closely matches annual consumption. Hence, with assets assumed to be maintained forever, there would be no need to provide any annual depreciation of assets, at least insofar as depreciation is to reflect a diminution of service potential.

Renewals accounting has always been controversial. An early variant, 'retirement reserve accounting' was the subject of much debate in the U.S.A. during the 1920s. The views of the Interstate Commerce Commission, the Internal Revenue Service and the U.S. Congress differed from those of valuation engineers and many accountants in the railway and public utility fields. Those valuation engineers and accountants strongly advocated the retirement method instead of a systematic depreciation accrual policy (Paton, 1932). The retirement method was used, for example, by leading U.S. electricity utility operator Samuel Insull in the early part of the twentieth century and endorsed generally for utility operators in 1922 by the National Association of Railroad and Utilities Commissioners (McDonald, 1962).

Renewals accounting was reconsidered in the 1970s and early 1980s in the U.K. as part of the reporting for nationalized industries debate (Byatt Report, 1986), and predictably it emerged in Australia in the late 1980s and early 1990s as a contested issue in the pervasive privatization/infrastructure debates (see, e.g., Currie, 1987). Others criticized renewals accounting on the ground that the method is inappropriate because the periodic expenditure incurred on maintaining infrastructure will not ordinarily approximate the average wearing out of those assets (Burns, 1992; Burns and Ritchie, 1995).

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[1] For a discussion of the practices of U.K. railway companies in the nineteenth century regarding the use of 'provision for depreciation or reserve for renewals', see Edwards (1986b [especially Huish *et al.*, pp. 199 and 269] and 1986c). Brief (1965) describes 'replacement accounting' evident in the nineteenth century.

The Steering Committee on National Performance Monitoring of Government Trading Enterprises (SCNPMGTE; a body charged with monitoring the performance of Australian government trading enterprises) rejected renewals accounting, asserting 'it does not result in the provision of information that is relevant to the assessment of GTE performance and financial position' (SCNPMGTE, 1994, pp. 62–3, and para. 267). The N.S.W. Local Government *Asset Accounting Manual* rejected renewals accounting as an acceptable alternative depreciation method based on the useful life of infrastructure assets, arguing that the service potential for most assets is, for practical purposes, used up or lost and thus has to be replaced (N.S.W. Department of Local Government, 1996b, p. 903). Yet that line of argument misses the point that renewals accounting has been presented as an alternative to *reserving* or *provisioning* for replacement, and was not properly described as a depreciation method.

Asset Valuation Using 'Current Cost Accounting'

Australian efforts to introduce or extend the application of accrual accounting to the public sector resulted in the ASCPA/ICAA's Public Sector Accounting Standards Board publishing, in succession, two statements on the applicability of statements of accounting standards to public sector business undertakings, followed by statements of accounting standards AAS 27 *Financial Reporting by Local Governments* (ASCPA/ICAA, 1990), AAS 29 *Financial Reporting by Government Departments* (ASCPA/ICAA, 1993) and AAS 31 *Financial Reporting by Governments* (ASCPA/ICAA, 1996).

By the 1990s current cost accounting generally, and SAP 1 (ASCPA/ICAA, 1976) in particular, had experienced a revival in Australia's public sector. Both AAS 27 and AAS 29 encouraged the use of written-down current cost (replacement values) to value assets when they were initially recognized by government agencies on the adoption of accrual accounting (AAS 27, para. 41; AAS 29, para. 61). The Australian profession's approach to accounting for infrastructure has been to advocate the use of current written-down replacement values, on the basis that such disclosures (alone, or in conjunction with information about depreciation) would convey meaningful information to readers (users) of financial statements. This view seems to be shared by recent writers in this area such as Pallot (1997) and Micallef and Pierson (1997).

Replacement price, current value and current cost accounting methods involve adjustments in accounts generally for changes in the replacement prices of particular physical assets. Price increases and decreases are regarded as 'capital adjustments', to be reported as a 'capital reserve' (say, 'replacement cost or current cost adjustment reserve') since no change in 'physical capital' is deemed to have occurred.

The introduction of accrual accounting for 'general government' agencies in the latter part of the 1980s created a need to adopt valuations for initial recording purposes, and replacement prices (or written down replacement prices) represented a convenient basis for that purpose. However, the 1990s Australian applications of CCA by public trading enterprises appears to have been motivated initially by a desire to use replacement cost as a surrogate for economic value. Moreover, the resulting denominator and numerator in rate of return calculations established demanding rate of return targets for PTEs, and such data could be used to legitimize rate increases (see Walker *et al.*, 2000). There has never been any compelling link to suggest such data would provide pertinent information for the types of infrastructure decisions motivating this article.

Asset Valuation at 'Optimized Deprival Value'

The deprival value accounting variant of replacement price accounting has become the dominant public sector accounting method (AARF, 1998; Walker *et al.*, 2000). Most recently, *optimized* deprival value accounting has emerged. In October 1994 the Australian SCNPMGTE published *Guidelines* with the stated aim being 'to provide the framework to enable the consistent approach to the valuation of non-current physical assets of GTEs [government trading enterprises]' (p. 1). The document asserted that in a perfectly competitive market, the value or market value of a GTE's assets would be its market buying price, the market selling price or net present value of future cash flows relating to the asset and these would all be the same (p. 42). Having noted that GTEs frequently operate in monopolistic or oligopolistic markets the document asserted that current 'value to the entity' is the appropriate measurement concept for physical non-current assets of GTEs. The *Guidelines* then set out tests for the definition and recognition of assets (straight from the accounting profession's conceptual framework project), and explained deprival value in the following terms:

> Under this approach, assets are valued at an amount that represents the loss that might be expected to be incurred by an entity if that entity were deprived of the service potential or future economic benefits of these assets at the reporting date. Thus the value to the entity in most cases will be measured by the replacement cost of the services or benefits currently embodied in the asset, given that deprival value will normally represent the cost avoided as a result of controlling the asset and that the replacement cost represents the amount of cash necessary to obtain an equivalent or identical asset. (1994, p. 3)

This produced the standard set of deprival value rules depending on whether it was assumed that an asset *would* or *would not* be replaced. If an asset were to be replaced the valuation would be either: (a) the current market price of a similar asset (where a similar asset could be purchased); (b) the current replacement cost of the same service potential or future economic benefits of the existing asset (where a different asset having a similar purpose can be purchased); or (c) the current reproduction cost of the same service potential or future economic benefits of the existing asset where techniques (a) and (b) are not applicable. If an asset were not to be replaced, then items were to be valued at the net present value of the cash flows expected from continued use and subsequent disposal (1994, p. 3). Solomons (1966), drawing upon the ideas of the 1920s European business economists Theodor Limperg, Fritz Schmidt and earlier nineteenth-century economists such as

Böhm Bawerk, had introduced these rules and they had been drawn upon in the U.K. Sandilands Report in 1975.[2]

The use of 'optimized deprival value' had been prescribed by the New Zealand Ministry of Commerce in the early 1990s (Ministry of Commerce, June 1994 and July 1994). Essentially ODV amounts to an estimate of the current cost of infrastructure required to produce the current ('normal') output of a PTEs services or product. It purportedly adjusts for 'overcapacity, overdesign and other legacies of past decisions; it recognizes opportunities for system bypass' (Ernst & Young *et al.*, 1990) and adjusts for lower consumer value. An objective of the ODV method is to exclude the value of assets, which provide excess capacity, from the denominator in calculations of rate of return, and from consideration in pricing determinations.

Asset Valuation Using 'Condition-Based Depreciation'

During the 1990s Burns advocated a method labelled *condition-based depreciation* (CBD; e.g., Burns, 1992; Burns and Ritchie, 1995) and that advice was taken seriously by Australian professional bodies. This method was said to be used in Australia by the N.S.W. Roads and Traffic Authority, and in New Zealand by several local councils (Burns and Ritchie, 1995). CBD is claimed to be an alternative to a formula-driven calculation of depreciation as it involves observing directly the deterioration of the infrastructure asset. Burns (1992, p. 98) noted that in practice this would require an assessment of

> what needs to be done to maintain the operating capacity of the asset . . . it considers all the work to be done by way of major maintenance, replacement or rehabilitation, simply to maintain the current capacity and standard of operation. (A master asset plan would add upgrades and extensions, i.e. new capital works, to this assessment of capital maintenance, to make a complete asset-management plan.)

The Australian UIG (1998) claimed this method is

> appropriate when significant expenditure is made on a periodic basis to restore a substantial proportion of the service potential of an asset or infrastructure system (or to replace a component thereof); . . . [It would] involve an annual depreciation charge based on the projected costs of restoring the service potential in the future, averaged (in some cases on a rolling basis) over the years till the restoration occurs . . . it may also include an amount reflecting that some of the existing service potential will not be restored. (para. 16)

As Sterling (1975, p. 24) and others observed, the accounting literature is replete with articles that recycle old ideas rather than resolve problems. Burns' arguments for condition-based depreciation are similar to those expressed more than fifty years earlier by writers who advocated that depreciation should be based on the loss of service potential of an asset—a notion which in itself was a variation of the 'units of production' method (Mason, 1928; Adams, 1930; Bauer, 1930; Nash, 1930; Sweeney, 1931).

The AARF's 1999 UIG Abstract 26 on provisions for major cyclical maintenance rejected showing such proposed CBD expenditure as a liability, or as accumulated depreciation or as a reduction in the carrying amount of an asset. This, notwithstanding that the 1998 UIG statement had embraced CBD as a *practical* approach for depreciating major infrastructure assets or systems where the infrastructure: (a) was necessary for the delivery of core services of a public sector entity, such as a water board or power authority; (b) had a very long life and would be required to be maintained to operate at a required minimum capacity over a very long period; (c) involved a detailed maintenance program; and (d) where it was not possible to reliably determine the useful life of the infrastructure asset or system (AARF UIG, 1998, para. 16). It would appear that the UIG had perceived CBD as a mechanism through which to create a fund for the periodic replacement of, at least, the service potential consumed. That latter feature was reiterated in a 1999 UIG Media Release 99-7 in which the appropriateness of CBD for pricing and budgetary purposes was acknowledged, but, for general purpose financial reporting purposes, CBD was rejected with this caveat: 'depreciation expense must be in accord with AASB 1021 or AAS 4'.

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[2] For a summary of these rules and some commonly stated objections, refer to Edwards *et al.* (1987, especially pp. 38–49).

A positive feature is that the need to estimate future life of the infrastructure assets is avoided under the CBD approach. But, as with depreciation calculated upon the basis of the current replacement price of assets, the service potential of infrastructure would almost certainly be increased with the injection of each lumpy expenditure, rather than be merely retained and then run down as progress was made to the next lumpy injection (Clarke, 1982). The charges remain *ad hoc*, and would thus necessarily have an *ad hoc* impact on the calculation of periodic income.

Most of the above proposals invite the inference that conventional means of asset accounting fail to provide pertinent data for those making replacement and related decisions about public sector infrastructure. They suggest that something outside conventional asset accounting methods is needed.

Double Account System

In the mid-nineteenth century a 'double account' reporting system was used by specialized U.K. companies, such as canal, turnpike and railway companies, whereby capital raised and expended on the construction of infrastructure assets was indefinitely capitalized, reported and ruled-off in (what was effectively) a *sunk cost* section of a two-part balance sheet (see Edwards, 1985, 1986c). In this way, expenditure on infrastructure and the sources by which it was financed (usually equity) were disclosed in what was described as the 'capital account'. Operating revenues and expenses (frequently including restoration and repair costs relating to the capital asset) were accumulated in an income and expenditure (profit and loss) account in the usual manner to identify the operating results. The 'general balance sheet' (the second part) contained the balances of the additional capital and borrowing to fund the other assets and the progressive outcomes of the periodic operations. In its original form, the physical assets in Part 1 of the balance sheet *generally* would have been valued at historical cost and conventional depreciation (when charged) also would have been on that basis. Companies were allowed and practised flexibility in the reporting of 'special items' such as the 'provision for the depreciation or the reserve for renewal of fixed assets' (Edwards, 1986c, esp. Figures 2 and 3). Dicksee's *Auditing* (1892) observed that

> the Double-Account system arose from the statutory requirement that all capital raised should be used for the carrying out of the works for the execution of which the company was created; and that the principle that, so long as the works were maintained in a state of efficiency their actual value need not be periodically reconsidered, arose from the circumstance that it was contemplated that the work authorized would be permanently carried on. (pp. 118–19)

Dicksee described some specific applications and indirectly illustrated how this form of accounting was similar to the 'Provisions for renewals' approach:

> Tramway accounts are prepared upon the 'Double Account' system; permanent way, rolling stock, and horses constituting the items of Capital expenditure... [For] the first two items, on account of the extreme difficulty of making any periodical estimate of their value, the method adopted is perhaps the most convenient one—the working being maintained in a perpetual efficiency rather than reduced by depreciation and increased by renewals... [For] 'Horses'... the unpermanent nature of this item appears to lend itself more readily to the usual method of treatment... by writing off depreciated value and debiting the account with fresh purchases. (p. 90)

Numerous nineteenth century examples of the double account system are reproduced in Edwards (1986a, 1986b). Further, Coombs and Edwards (1993) noted that the double account system was extensively used by municipal corporations from 1889 and that it was established formally in 1930 as the main type of accounting to be adopted by those corporations.

More recently, a variant of the double account system has been proposed as a means of reporting on infrastructure during periods of high inflation: in Australia for electricity and mining companies (Chambers, 1975, 1979) and for public sector accounting in the U.K. (Wells, 1984) and Australia (Clarke and Dean, 1996).

It has also been suggested that were the double account system to be used to report lumpy infrastructure expenditure to replace the consumed service potential of the original *capital asset*, it may well achieve much the same outcome as pursued by renewals accounting, but avoid the reporting problems perceived with that method. The question of *reserving* surpluses *for replacement* would return to being a budgetary matter (Clarke and Dean, 1996).

Supplemental Disclosure of Asset Management Plans

Another option, reflected in practices adopted at state or local government level in Australia, requires agencies or local councils to develop 'asset management plans' (see references in Table 1 to N.S.W. Department of Public Works, 1992; N.S.W. Department of Public Works, 1993, Institute of Municipal Engineering Australia, 1994; N.S.W. Treasury, 1996; N.S.W Department of Local Government, 1996b).

Essentially these plans involve specification of likely (or proposed) levels of service to be provided by infrastructure in the future, exploration of issues such as demand management (through pricing policies) or the possibility of outsourcing certain functions. From this process, consideration is to be given to the policies of the government of the day—and from that, development of capital investment strategic plans.

In some areas (such as planning accommodation requirements) plans may well be constrained by government-wide practices or private sector benchmarks.[3] In relation to other forms of infrastructure, it is possible (even likely) that strategic asset management plans may be influenced by the views of engineering staff facing incentives to promote high levels of expenditure on existing infrastructure and on new, ambitious, capital works projects. Ultimately, governments or local councils must assess and rank competing bids for scarce resources in a given budgetary period.

In Australia, for example, local councils must provide data in their financial statements based on their strategic asset management plans. Providing financial data about proposed maintenance expenditures in the financial statements has been questioned by some engineers. They have claimed that it would be preferable to provide data comparing actual maintenance expenditure against the proposed management plans that either had been authorized by Treasury or had been agreed to internally by government agencies. This information could be provided as a note to the financial statements.

Supplemental Disclosure of Contractual Commitments

A further option—suggested by private sector regulatory requirements rather than the academic literature or recent reporting practices—engages supplemental disclosure of financial obligations arising from current contractual commitments affecting cash flows. The Australian Corporations Law has, until recently, required the publication of information about capital commitments and other expenditure commitments, with some exceptions (i.e., commitments to purchase inventories). The sums payable are to be shown in 'bands' representing the time periods in which those sums are payable (for a discussion of the rationale for these requirements, see NCSC, 1983). In May 1997 these provisions were withdrawn since they had been included in an Australian Accounting Standard AASB 1034 (1996).

There is a dual practical effect of these requirements. Plainly they ensure disclosure of commitments to undertake capital works. These might not otherwise be recorded as liabilities because they do not relate to sacrifices of economic benefits that an entity is presently obliged to make as a result of past transactions or events. However, they have led to disclosure of gross sums payable for operating leases (which are not recognized as liabilities in terms of current accounting standards). Further, they also have led to disclosure of gross sums payable when balance sheet recognition may have involved a different basis of measurement (e.g., finance leases, or commitments for site remediation in the mining industry).

The potential application of these private sector requirements to the public sector could include disclosure of financial commitments associated with private sector financing of new infrastructure (through 'Build, Own, Operate, Transfer' schemes)—a subject which is beyond the scope of this article.

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[3] In Australia, for example, one year after a lengthy water crisis in Sydney, the following appeared: 'Water clean-up nobbled: Treasury raid starves new catchment authority of funds'. M. Hogarth, *Sydney Morning Herald*, 26 July 1999, p. 1.

The scale of these commitments will affect the extent to which public sector agencies (or governments as a whole) have the financial capacity to allocate funds to new or additional projects. Disclosure of such contractual commitments could also serve to identify the nature and extent of any contractual steps already taken to maintain, repair or upgrade infrastructure through arrangements with external parties. However, a serious limitation of these disclosure requirements for this purpose is that they only relate to work undertaken by external parties.

OVERVIEW OF THE OPTIONS

It is emphasized that some of the various 'options' arrayed above could be combined. Different approaches to asset valuation (options 5–7) could be associated with different approaches to the identification of 'provisions' or 'reserves' for maintenance or asset replacement, and could be combined with different forms of supplemental disclosures (options 9–10).

To some extent such combinations would raise questions about the quantification of constituent items. For example, if assets were to be valued at 'optimized deprival value', and an entity had excess capacity, then should any provision for deferred maintenance be calculated having regard to the optimum set of assets that should be held, rather than to the set of assets which were actually held?

However, there are some broader themes which deserve attention. Throughout a literature on infrastructure accounting or reporting extending more than a hundred years (dating from Dicksee's work in 1892 to the 1999 Australian UIG statement), a common theme has been the reference to expected expenditure on simply *maintaining* infrastructure, not *upgrading* it to higher standards of functionality. Yet the periodic nature of lumpy expenditures on infrastructure almost ensures that new technologies may be used and that these may lead to an upgrading of existing infrastructure and an enhancement of its functionality. Recall the 1998 IFAC statement above regarding the possibility in the future of recognizing deferred maintenance costs as a liability.

Current diversity in practice presaged Australia's 1998 and 1999 UIG statements, the 1998 FASAB SFFAS 6 and the IFAC International Study (1998) on the reporting of major cyclical maintenance expenditure. Ambiguity in authoritative statements on accounting concepts issued earlier by the accounting professions in Australia (SAC 4, 1992), the U.S.A. (FASB SFAC 1, 1978 and SFAC 6, 1985), New Zealand, U.K., and in other authoritative professional and regulatory pronouncements (see Table 1), was a major factor in creating this diversity of practice. The ambiguity related primarily to when to recognize a liability. As previously, the inherent conflict appeared to be between restricting the ability to raise a *liability* only to situations when there exists a legally binding enforceable obligation to pay a determinable amount, and freeing up the opportunity to create a *provision* for an uncertain but expected outlay.

A brief excursion into this current state of the conflict follows. Equivocation in practice on the reporting of provisions remains (Lennard and Thompson, 1995) notwithstanding the conceptual framework exercise in the U.S.A. (FASB SFAC 1, 1978) and similar national conceptual framework exercises elsewhere (Gore, 1995).

Yet the position seemed to have firmed in 1985 when the FASB noted that '*Liabilities*... involve non-discretionary future sacrifices of assets that must be satisfied on demand at a specified or terminal date, or on the occurrence of a specified event' (FASB, SFAC 6, 1985). This was confirmed in subsequent national conceptual frameworks—consistent with most of the early accounting theorists' views, liabilities (and hence provisions) generally were specified to require a formal, legal obligation or commitment to incur expenditure or transfer resources.

While professional proscription was apparent also in Australia, the following 1992 guidance notes on the application of Statement of Accounting Concepts (SAC) 4 confirmed that some private sector entities continued to make a *provision* for future maintenance:

> Some entities have regularly 'provided'... for expected future expenditures on maintenance, repairs... and recognized the 'provisions' as liabilities and expenses... [notwithstanding they] do not involve a present obligation... do not represent liabilities... the motivation for the creation of [some of] these 'provisions' may have been the failure by the entity to conduct regular maintenance, repairs and overhauls... [but this] does not create a liability. (ASCPA/ICAA, SAC 4, p. 64)

Table 1 summarizes the array of authoritative positions regarding the reporting of deferred and major cyclical maintenance over approximately the last twenty years (note that this Table does not canvass all reporting options identified above). In the face of such diversity of opinion, one might expect diversity in practice. Hence it is not surprising that in Australia efforts were made to give greater certainty through the issue of a Guidance Note (October 1998) and a UIG Abstract (June 1999) on the subject of accounting for maintenance expenditure. These statements emphasize the need presently to establish the existence of an 'obligation' before a liability can be recognized. The IFAC (1998) Study, however, alludes to this possibly changing in the future.

Table 1 illustrates also the authority given by profession-sponsored statements in Australia, N.Z., the U.K. and the U.S.A. for provisioning for 'cyclical maintenance'. The profession's recommendations are that those provisions be reported as 'non-liabilities'. While those potential expenditures may not be obligatory, and do not have any specific quantifiable financial attribute to be measured, management's intentions nevertheless need to be disclosed. Presumably this mode of disclosing management's current intentions is a reflection of the current state of thinking (at balance date) about the current condition and functionality of the asset. This is reinforced by the recognition in many statements of the importance of transparent asset management plans.

It is to be expected that the political dimension impacts heavily on information regarding the management of public sector infrastructure. Further, budget constraints clearly have the potential to frustrate what otherwise might be regarded as the implications of sound decisions regarding infrastructure management. Recurrent expenditure for maintenance might likewise come under attack. But ultimately, sensible plans and justifiable recurrent expenditures, justifiable injections of imputed provisioning for anticipated future outlays, and the like, are *ex post* of the receipt of (essentially engineering) information regarding the physical state and prospective

TABLE 1

CHANGING AUTHORITATIVE STATEMENTS REGARDING REPORTING OF PROVISIONS FOR MAINTENANCE

Year	Position	Source documents
Advocacy of discretionary use of a provision for deferred maintenance		
1994	Unnecessary for compulsion to exist for public sector agencies to establish a provision for major periodic maintenance expenditure (see summary cited in AARF, 1998, para. 2).	N.S.W. Treasury Circular (1994); withdrawn, Treasury Circular 99/08 following AARF UIG, Abstract 26, June 1999
1995	It is noted that there are private sector instances in respect of (a) operating losses and (b) restructuring costs of reporting provisions as a liability based on management's intentions to make expenditure (a commitment) rather than on the basis of any present obligation to do so.	Lennard and Thompson (1995)
Advocacy of provision for major cyclical maintenance		
1989	'A provision for major "overhaul" maintenance is to be established to anticipate the need to carry out non-routine maintenance programs at cyclical intervals . . . to be charged separately as a period expense in the Income and Expenditure statement; the provision should be written down as the overhauls maintenance is actually carried out.'	N.S.W. Treasury (1989)
1992	'Some entities have regularly "provided" in the financial statements for expected future expenditures on maintenance, repairs and overhauls relating to major items of property, plant and equipment and recognized the "provisions" as liabilities and expenses. . . . [They] do not involve a present obligation . . . [they] do not represent liabilities'.	ASCPA/ICAA, SAC4 (1992, p. 64)
1994	N.S.W. Treasury Circular (1994) noted that provisions for major cyclical maintenance should appear as *contra* assets rather than *equity* items. 'The provision for major periodic maintenance is similar to a provision for depreciation. It is not a liability.'	N.S.W. Treasury Circular (Guidelines for Capital Expenditure in the N.S.W. Public Sector; 1989, 1994, 1998)
1996	N.S.W. Treasury Circular (1996) deferred the requirement for 'budget dependent agencies to recognize a provision for major periodic maintenance in the annual financial statements based on their approved asset management plans', in order for Treasury to complete approval of their asset maintenance plans.	N.S.W. Treasury Circular 1996 (Accounting for Major Periodic Maintenance -TC 96/7; amended Treasury Circular 98/03 23 June 1998); withdrawn, Treasury Circular 99/08 following AARF UIG Abstract 26, June 1999

TABLE 1 (cont'd)

Year	Position	Source documents
Advocacy of provision for deferred maintenance as a contra asset		
1978	*Liabilities* . . . involve non-discretionary future sacrifices of assets that must be satisfied on demand at a specified or terminal date, or on the occurrence of a specified event.	FASB, SFAC 1 (1978)
1985	*Liabilities* . . . involve non-discretionary future sacrifices of assets that must be satisfied on demand at a specified or terminal date, or on the occurrence of a specified event.	FASB, SFAC 6 (1985)
1989	'A provision for major "overhaul" maintenance is to be established to anticipate the need to carry out non-routine maintenance programs at cyclical intervals . . . to be charged separately as a period expense in the Income and Expenditure statement; the provision should be written down as the overhauls maintenance is actually carried out.'	N.S.W. Treasury (1989)
1992	'Some entities have regularly "provided" in the financial statements for expected future expenditures on maintenance, repairs and overhauls relating to major items of property, plant and equipment and recognized the "provisions" as liabilities and expenses . . . [they] do not involve a present obligation . . . [they] do not represent liabilities.'	ASCPA/ICAA, SAC 4 (1992, p. 64)
1994	N.S.W. Treasury Circular noted that provisions for major cyclical maintenance should appear as *contra* assets rather than *equity* items. 'The provision for major periodic maintenance is similar to a provision for depreciation. It is not a liability.'	N.S.W. Treasury Circular 'Guidelines for Capital Expenditure in the N.S.W. Public Sector' (1989, 1994, 1998)
1995	'The formal adoption of a budget, the passing of an appropriation legislation or the establishment of a grant programme by a government do not, of themselves create present obligations by the government' (para. 59). 'Furthermore, the action of an entity in setting aside reserves for a future event [because the entity does not have a present obligation to an external party] does not give rise to a liability' (para. 60).	ASCPA/ICAA, SAC 4 (1995)
1995	Provisions should be recognized only when there is a present obligation to transfer economic benefits as a result of past events (para. 2.1.9).	IASC Framework (1995)
1996	N.S.W. Auditor-General allows provisions for redundancies, etc. if evidence available that they constitute 'commitments albeit not legally binding'.	N.S.W. Auditor-General (1996)

1997	Relying on the 'lack of any obligation' U.K. FRED 17 prohibits use of provisions for repairs and maintenance expenditure.	ICAEW ASB, FRED 17 'Measurement of Tangible Fixed Assets' (1997)
1998	Again relying on the obligation argument, the IASC proscribes recording a provision for major refits or refurbishments as a liability.	IAS 37 'Provisions, Contingent Liabilities and Contingent Assets' (1998)
1998	'Deferred maintenance of PP&E is an economic cost for both the private sector and the government. However, because there is not a liability which meets present recognition and measurement criteria, deferred maintenance is not generally recognized in either sector' (p. 18).	IFAC, ED 'Perspectives on cost accounting for governments' (1998)
Advocacy of renewals (or similar) accounting		
1989	In discussing options for public sector reporting and accounting for physical assets the CICA includes renewals accounting and encourages that it should be considered along with other 'innovative approaches that take account in the current year of the cost and the financing consequences of deferring required maintenance to future years' (p. 65).	CICA (1989)
1994	Renewals accounting proscribed; provision for deferred maintenance to be offset against asset. There is recognition that 'some entities have recognized provisions for maintenance as liabilities'. But the Guidelines proscribe such an approach (para. 271).	SCNPMGTE (1994)
1997	In Australia and New Zealand the renewals annuity method is allowable for a broad asset system that must be maintained indefinitely provided there is an 'asset management plan' which incorporates future asset renewals that can be justified and audited.	Standing Committee of the Agriculture and Resource Management Committee of Australia and New Zealand, (SCARM, 1997)
1998 and 1999	In Australia 'Major Cyclical Maintenance accounting and Condition Based Depreciation methods may be adopted to identify the consumption of the service potential of complex assets for financial reporting purposes' (AARF, 1998, Recommendation, para. 32). A subsequent AARF UIG Abstract reiterated this position, but in a media release the UIG indicated that for reporting purposes, however, 'depreciation expense must be in accord with AASB 1021 or AAS 4' (AARF, 1999b).	AARF (1998, 1999a, 1999b)

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Table 1 (cont'd)

Year	Position	Source Documents
Deferred maintenance in hybrid and non-financial reporting options		
1989	CICA recommends 'as a minimum, depreciable assets should be amortized in a systematic manner over their useful life and deferred maintenance, to the extent not recorded in the accounts, should be disclosed as a note to the financial statements'.	CICA (1989)
1991	The FASB rejects the use of reserves to 'smooth income' (para. 65).	SFAS 5 'Accounting for Contingencies' (1991)
1993	Expenditure in excess of amounts needed to *maintain* future economic benefits is to be treated as an increase in the carrying value of an asset, and thereafter subject to depreciation.	AAS 4 / AASB 1021 'Depreciation' (1993)
1995	A line item for 'deferred maintenance amounts' shall be presented on the statement [of U.S. Federal government agencies] of net cost with a note reference in lieu of a dollar amount. No amounts shall be recognized for deferred maintenance' (para. 79).	SFFAS No 6 (1995)
1998	In Australia 'Major Cyclical Maintenance accounting and Condition Based Depreciation methods may be adopted to identify the consumption of the service potential of complex assets for financial reporting purposes' (AARF, 1998, Recommendation, para. 32).	AARF UIG (1998)
Advocacy of disclosure of management plans		
1992	N.S.W. Department of Public Works issued *Total Asset Management Manual* which promoted development by state sector agencies of management plans encompassing future major expenditure on capital works. See also recommendations for asset management plans by the Institute of Municipal Engineering Australia (IMEA, 1994).	N.S.W. Government Department of Public Works (August, 1992); IMEA (1994)
1993	N.S.W. Minister for Public Works issues guidelines for preparation of strategic business plans for water supply and sewerage schemes to support the innovative 1993 N.S.W. local government legislation requiring councils to report the physical state of infrastructure under their control and amounts needed to maintain it in a 'satisfactory condition'.	N.S.W. Government Department of Public Works (November, 1993)
1994	Institute of Municipal Engineering Australia (IMEA) requires government agencies or local councils to develop 'asset management plans'.	IMEA (1994)
1997	In New Zealand the renewals annuity method is allowable for a broad asset system that must be maintained indefinitely provided there is an 'asset management plan' which incorporates future asset renewals that can be justified and audited.	SCARM (1997)
1998	In Australia 'Major Cyclical Maintenance accounting and Condition Based Depreciation methods may be adopted to identify the consumption of the service potential of complex assets for financial reporting purposes' (AARF, 1998, Recommendation, para. 32).	AARF UIG (1998)

functionality of the infrastructure. Arguably too, the capacity of the public at large to assess the accountability and to evaluate the propriety and underlying wisdom of government decisions regarding such matters necessitates disclosure of the engineering information relevant to the decisions taken. The financial impact of those decisions is unlikely to be sufficiently transparent to satisfy reasonable claims of accountability.

Local and overseas conceptual framework documents have explained that 'deferred maintenance' may relate to the works not completed within a period, having regard to a prior projected program for maintenance (see AARF UIG, 1998). It is doubtful that realistic programs for maintenance can be developed on assumptions quarantined from resource considerations. A big-budget road maintenance program might include repairs to attend to 'roughness'. A small-budget maintenance program might only cover repairs to potholes, cracking and road edges, without any expenditure to correct roughness except where roughness affected safety. It also is necessary to consider that society's desires regarding road roughness possibly drive actual expenditure. Infrastructure functionality is a crucial assumption in determining what amount of deferred maintenance should be reported.

A CONTESTABLE FOCUS: 'USERS' VERSUS 'USES'

Paralleling attempts to prescribe a general measurement approach for the private sector (e.g., AARF, 1998), authorities generally have presumed that it is necessary to identify the users of public sector accounting data and what those users require for their normal decisions (Jones, 1992). Pallott (1997) acknowledges users' *supposed* needs for information in an open society. Ultimately the delineation of this matter is an empirical question. Identifying users was undertaken in limited settings by the inquiries of Van Daniker and Kwiatkowski (1986) and Jones and Puglisi (1997) into the attitudes of different forms of reporting by public sector agencies. The former study appears alone in analysing the most appropriate ways of reporting on infrastructure for the benefit of users, namely: governments and pubic servants providing policy advice, politicians, or interested members of the community.[4] It listed six forms of information about infrastructure (i.e., historical cost, replacement cost, current dollar cost, budget to actual information, financial plans information, and engineering information). It then identified nine issues about which users might seek information and found that for eight, engineering information was preferred ahead of other forms—highlighting a demand for information additional to traditional accounting information (p. 118). Rowles' 1992 study of financial reporting of infrastructure for the Australian Accounting Research Foundation acknowledged the authority of the Van Daniker and Kwiatkowski study, but then perversely failed to cite the relevant findings about the need to report engineering-based information in preference to accounting-based information.

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[4] Perhaps drawing from Anthony (1978), Jones and Puglisi (1997) also identified a potentially wide range of possible external users of general purpose financial reports of government departments: parliament, other government departments, taxpayers, creditors, resource providers, consumers, donors, special interest groups and regulators. Of these, AAS 29 suggests that parliament is the most important user (para. 23). A similar set of users using a three-tier classification was specified in Micallef *et al.* (1994). Data in Carnegie and West (1997) revealed that ED 50 (forerunner to Australia's AAS 27) did not accord with local government users' responses as to what they regarded as pertinent information for decisions about infrastructure assets.

A telling aspect of that literature is the general focus on 'users' needs' and 'users' decisions'. In this respect it mirrors the *private sector* accounting literature relating to infinitely adaptive companies. *Neither* presents much regarding which data enter particular decisions or, indeed, precisely what those decisions are. But, that is entirely consistent with the 'decision usefulness' theme that permeates conceptual framework exercises. It has been argued elsewhere that, in the context of private sector adaptive enterprises, a focus on 'uses' might provide more insight to the nature of information that could prove more fit for, serviceable in, the uses known to be made of a particular datum (American Accounting Association, 1966; Clarke and Dean, 1992). In the latter, argument centred on financial ratios and the like calculated with the data extracted from published general purpose financial statements. While that focus could be equally valid in the context of non-adaptive utilities or other forms of public sector agencies, the issues associated with dealing with infrastructure possibly make a departure from 'users' to 'uses' even more apt in respect of the public sector operations. That is because a critical aspect of infrastructure management (particularly current maintenance of functionality and retention or replacement decisions) is the assessment of the current functional state of the infrastructure *in situ*. The financial dimensions of that evaluation are in many respects a second-order focus—they cannot be determined sensibly without information regarding the infrastructure's physical attributes. In contrast, neither the basis upon which infrastructure is valued for balance sheet purposes nor whom the users of the information are, is likely to influence truthful outcomes of engineering assessments of the assets' physical state.

The conceptual framework literature recognizes the need to consider appropriate criteria for determining the information needs of those identified as potential external and internal users of public sector accounting data. Generally, *relevance*, *reliability*, *materiality*, *comparability*, *understandability* and *timeliness* are presented as the ideal criteria which accounting information ought to possess. At issue is how data might be judged in terms of meeting those criteria. Whether and, if so, how such characteristics might apply to information about public sector infrastructure decisions concerning particular uses warrants attention.

AN ASSESSMENT OF THE MAIN INFRASTRUCTURE REPORTING OPTIONS

It was above revealed that, within the accounting literature, virtually all the discussion on public sector infrastructure relates to balance sheet valuation and presentation. Information about whether government agencies have *adequately maintained* their infrastructure is not apparent from the form of financial disclosures currently provided in general purpose financial statements prepared in terms of the profession's accounting standards, conceptual frameworks and, in Australia, related state Treasury Circulars. Many infrastructure assets are extremely durable. They continue to provide some level of service long before breakdown and long after serious declines in their functionality. In this context, it is worth recalling claims that high levels of indebtedness (e.g., through the failure of governments to fund defined benefit pension schemes fully) will impose burdens on future generations (N.S.W. Public Accounts Committee, *Report 10*, 1984, paras 10.9–10.17; Western Australia Public Accounts and Expenditure Review Committee [WA PAERC], 1991; for further details see Walker *et al.*, 1999). These arguments have been invoked to propose public sector accrual accounting procedures coupled to various asset valuation options. For example, governments now record their unfunded obligations for superannuation schemes as liabilities in balance sheets prepared on an accrual accounting basis. Arguably, this is an imperative to report in similar fashion to the implied obligation to maintain existing infrastructure for future generations—so as to avoid imposing burdens on future generations. The nature of that obligation warrants further discussion.

In the public sector, the converse of propositions that financial burdens are being passed on to future generations through debt or liabilities is that past and current generations may also be passing on benefits through past investment in infrastructure. Correspondingly, it has been argued that regard should be had to the time profile of the services expected of an asset, so that, for example, borrowing arrangements could be designed to ensure that repayments broadly matched that pattern of benefits, thereby achieving a measure of inter-generational equity (WA PAERC, 1991, p. 118).

It has been suggested that a tally of that investment and of the amounts required to keep infrastructure operational would thus be critical if policy makers within government (and others engaged in debates about inter-generational equity issues) are to be fully informed (Walker *et al.*, 1999). The Walker *et al.* study noted that intergenerational equity arguments become complicated with the introduction of factors such as population growth and age distribution, and the likely sources and changing levels of national savings. The following analysis suggests that, in terms of the reporting options examined in above, there is a need to augment the reported financial statement data (Profit and Loss, Balance Sheet and Cash Flow information) with detailed 'supplementary disclosures' of engineering-based data (as in Schedules 1 and 2 below). They may relate to what is necessary to maintain or upgrade system functionality or identify the potential risk of system failure, including the assumptions upon which those matters are based.

It is not surprising that the system of accrual accounting being imposed upon public sector reporting has spawned infrastructure reporting mechanisms that have been massaged to *fit* the private sector experiences with non-infrastructure assets. Little attention appears to have been given to the unique nature of infrastructure assets and the *general* absence of an identical counterpart in the private sector (Barton, 1999). Even with the highly specific character of some private sector assets, it is rare that they correspond to all of the features of public sector infrastructure.

Pallot (1997) surveyed the various characteristics of public sector infrastructure and generally concluded that the nature of most infrastructure lies outside the private sector experience. Pallot did not question whether the numerous reporting and valuation *options* canvassed for public sector assets (see 'Reporting Options', above, and Table 2) may not be serviceable for informing users of public sector accounts of the salient features of public sector infrastructure. Most importantly, despite clear evidence that some of the literature to which she referred acknowledged the importance of physical engineering-based assessments (e.g., Van Daniker and Kwiatkowski, 1986), the discussion was pursued almost entirely by analysing what financial representations might be included in financial statements.

Table 2 presents in summary form an assessment of the main reporting options, in terms of three criteria: the relevance, reliability and comparability of the information which might be presented in terms of those options. The context entails judgments about the allocation of scarce resources to competing projects or programs, including the maintenance, repair and upgrading of infrastructure assets. Several commonly proposed 'recognition' and 'display' reporting options are examined. The options considered are those reviewed above, together with the proposal for supplemental disclosures of 'engineering data', outlined under 'Overview of the Options'. The three 'non-recognition' options examined have not been seriously considered previously in the context of assessing public sector financial reporting options.

Whereas those myriad financial reporting options seek to provide financial assessments of public sector infrastructure, they omit consideration of the critical physical dimensions of the matter. The accounting literature recycles ideas and contains seemingly endless discussion of the virtues of each of the above financial reporting bases over the others. It also contains numerous variants of each. All with little resolution. *Historical cost* in whatever form is indicative of money gone; *replacement cost* in all its variants is indicative of money needed to replace what is already in possession; *deprival (optimized deprival) value* are measures of the cost of making good of what *one might be deprived of*; and *renewals* are the cost of creating what exists in its current condition irrespective of technological change. These aspects were addressed in Walker *et al.* (2000). The relevance, reliability and comparability of the information produced by each of those bases in the context of informing the general public of the state of infrastructure are contestable. Recent additions to the list have been proposals to report Asset Management Plans, Contractual Commitments or Schedules of Engineering Data. Table 2 classifies such proposals as non-recognition, for such reported data draw upon both financial and physical attributes of infrastructure which would normally be presented as 'Note' information to support particular reported financial numbers related to infrastructure. A major deficiency of reports such as those is that they could represent engineers' ambit claims to upgrade infrastructure based on ideal, best technology—without regard to an entity's financial capacity to undertake the work.

A PROPOSED APPROACH TO PRESENTING SUPPLEMENTAL DISCLOSURES ON THE PHYSICAL CONDITION OF INFRASTRUCTURE

Schedules 1 and 2 illustrate a possible framework for presenting, in summary form, key engineering information (as suggested in option 9 in Table 2) about the state

TABLE 2

ASSESSMENT OF INFRASTRUCTURE REPORTING OPTIONS[a]

Context: Judgments are to be made about the allocation of scarce resources to competing projects or programmes, including the maintenance, repair and upgrading of infrastructure assets. Certain elements of maintenance, repair and upgrading expenditure can be deferred for one or more years without immediately compromising safety or materially risking disruption of supply. However, deferral of expenditure may increase expenditure ultimately required on maintenance or repair. Some infrastructure may warrant replacement rather than repair.

Judgments:

J1: What have been the consequences of past asset management policies or external events, in the light of current knowledge about consumer demand, the external environment, risks of system failure, etc.?

J2: What level of funding is appropriate for the maintenance, repair, upgrading or renewal of infrastructure in the coming financial period, and beyond?

Given this context how do the following reporting systems fare in providing data pertinent to those decisions? Consider these two judgments on the basis of the following criteria?

Recognition/reporting options[b]	Proponents	Data relevance	Data reliability	Data comparability
1. Historical Cost (HC) • Provision for deferred maintenance reported as: (i) a liability (ii) a contra asset	Numerous advocates over the years State Treasury guidelines (see Table 1)	Re: J1—(i) and (ii) not relevant Re: J2—(i) and (ii) not relevant	Re: J1 HC could be a reliable indicator of past expenditure Re: J2—not indicative of any liability or asset cost recovery	Data would not be serviceable for *intra* or *inter* public sector enterprises (PSE) comparisons on either a *static* or *intertemporal* basis
2. Replacement Cost (RC) • Provision for deferred maintenance reported as: (i) a liability (ii) a contra asset	SCNPMGTE (1994) State Treasury guidelines (see Table 1 above)	Re: J1—(i) and (ii) not relevant Re: J2—(i) and (ii) not relevant	Re: J1 RP may be indicative of cost were past policies to be replicated in the current cost structure Re: J2—not indicative of any liability or asset cost recovery	Data would not be serviceable for *intra* or *inter* PSE comparisons on either *static* or *intertemporal* basis
3. Optimized Deprival Value (ODV) • Provision for deferred maintenance reported as: (i) a liability (ii) a contra asset	Ernst & Young (1990); SCNPMGTE (1994); N.S.W. IPART (1996); State Treasury guidelines (see Table 1); Walker *et al.* (2000)	Re: J1—(i) and (ii) not relevant Re: J2—(i) and (ii) not relevant	Re: J1 and J2 Note: by virtue of added subjectivity, ODV is less reliable than RP	As for RP

TABLE 2 (cont'd)

Recognition/reporting options[b]	Proponents	Data relevance	Data reliability	Data comparability
4. Renewals Accounting	ICAA, 1946a Paton, 1932 Samuel Insull's preferred method as reported in McDonald (1962)	Re: J1—relevant to monitoring of cost of implementation of past policies Re: J2—not relevant	Re: J1—fully verifiable—has potential to be highly reliable of actual expenditure Re: J2 not reliable indicator of required expenditure to maintain infrastructure functionality	As for HC
5. Condition-based depreciation	Burns (1992); Burns and Ritchie (1995); AARF UIG (1999)	Re: J1—not relevant Re: J2—not relevant While the observation of physical condition is highly relevant, the financial quantification is *ex ante* and highly subjective	Re: J1—contestable Re: J2 not reliable for immediate following period; possibly of greater reliability over a longer period	Since the data contain a mix of estimates made at different times and by different persons, comparisons would be highly contestable
6. Double account • Provision for deferred maintenance reported as: (i) a liability (ii) a contra asset	Dicksee (1892); Edwards (1985); Chambers (1979); Wells (1984); Clarke and Dean, Commentary in N.S.W. IPART (1996)	Re: J1—(i) and (ii) not relevant Re: J2—(i) and (ii) not relevant	Re: J1 HC could be a reliable indicator of past expenditure Re: J2—not indicative of any liability or asset cost recovery	As for HC

Non-recognition/reporting options	Proponents	Data relevance	Data reliability	Data comparability
7. Asset management plans	N.S.W. *Local Government Asset Accounting Manual* (1996b) N.S.W. DPW&S (1992, 1993)	Re: J1—relevant on a *rolling* basis Re: J2—highly relevant—could be indicative of current requirements	Not highly reliable	In broad terms consecutive plans could be comparable in both qualitative and quantitative terms
8. Contractual commitments	Companies Act and Codes; Commonwealth Corporations Law 1991; AASB 1034 (1996)	Re: both J1 and J2—highly relevant	Re: J1—highly reliable in respect of assessing the adequacy of the commitments Re: J2—highly reliable	Successive yearly disclosures could be matched to both actual work undertaken and related expenditures and compared with the relevant forward budget estimates
9. Schedule of engineering data	Walker *et al.* (1999)	Re: both J1 and J2—highly relevant	Subject to assumptions upon which the data are based, could be highly reliable and verifiable	Consecutive data could be very serviceable for evaluating past performance and for assessing future requirements

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[a] Outlines of these options are in various forms reflecting often the biases of the proponents of the articles. Summaries of several of the financial measurement options are provided in FASB SFAC 6; Steering Committee on National Performance Monitoring of Government Trading Enterprises (1994); AARF Monograph #10, 1998; N.S.W. IPART (1996). Examples of non-financial *Schedules of Engineering Data* are provided in Schedules 1 and 2 below. For a summary table of pertinent standards and Australian state Treasury guidelines prior to 1995 see Institute of Municipal Engineering Australia (1994, p. 3.35).

[b] The number of options here differs from those described in the section on reporting options. As noted in the text, the ten 'options' arrayed there could be combined. Different approaches to asset valuation (options 5–7) could be associated with different approaches to the identification of 'provisions' or 'reserves' for maintenance or asset replacement, and could be combined with different forms of supplemental disclosures (options 9–10).

of two major categories of infrastructure: sewerage systems and water supply. These schedules were developed after consultation with engineers with experience in the industry, and they highlight the complexity of the issues faced if attempts were made to present 'engineering data'. They suggest a case for a form of reporting that focuses on not just an overall 'system', but on components of a system which have differing economic lives, and which present the greatest exposure to system failure (or of failures to sub-sets of a system which would affect a high proportion of the population or clientele). These supplementary disclosures would augment *financial* data presented in the financial statements.

The information disclosed would combine both descriptive information and condition assessments—for example, by listing the number of kilometres of pressure pipes, and identifying components of the system which may require upgrading or replacement in the near future to ensure continuity of supply to the communities served by that infrastructure. Note that these disclosures would necessarily involve assumptions about the continued use of different types of infrastructure (e.g., that sewage would continue to be disposed through ocean outfalls rather than be subject to secondary and tertiary treatment within local catchment areas). Brief explanations of those assumptions would assist users to understand the basis on which infrastructure was being managed.

The complexity of the disclosures provided would reflect the nature of the geography and demography of local areas. The population of Australia's largest city, Sydney, can be viewed as living in almost local water catchment areas, while the terrain around another large city, Adelaide, is mainly gently sloping towards the sea—so that disclosures by the water authority in Sydney would necessarily be more complex that that provided for Adelaide.

Reports on projected needs for future capital investment on infrastructure may be easier to interpret if they were augmented by disclosures of proposed or projected cash flows on that work, whether for future maintenance and for upgrading. Care would be needed to minimize creating incentives to those responsible for these reports from lodging 'ambit claims', to promote favoured projects. On the other hand, periodic disclosure of candidates for capital works within the public sector may ensure greater transparency in resource allocation, and greater involvement by the community in debates about policy priorities. It may not be possible (or even desirable) to take the politics out of the budget process. But it may be possible to ensure greater accountability on the part of both bureaucrats and elected representatives.

Given concerns about the disruptions caused in recent years by system failure (notably in the gas or electricity businesses in Australian cities of Melbourne and Brisbane, and in one of New Zealand's largest cities, Auckland) it may be possible for descriptions of infrastructure condition to refer to the extent to which systems incorporate redundancy or other safeguards against such risks. Such a process could not eliminate all risks, but it could ensure that the range of risks is considered systematically, and managed.

It might be noted in passing that advocacy for using 'optimized deprival value' accounting for the valuation of infrastructure, together with the establishment of

MAIN FUNCTIONS AND DOMINANT TECHNOLOGIES

Major functions	Principal method	Main technologies	Technology subgroup	Life years	Initial assumptions changed expectations	Probable status of knowledge of physical condition
1. Pre-treatment at source	Specific to waste					
2. Transport	Gravity flow, 'separate system', networks	Pipes Constructed and enclosed channels	Clay pipe Cast iron Concrete Plastics	Indefinite[a] Medium Medium to long Long	Networks assumed stormwater inflow and overflow acceptable Gas control is the key to deterioration	Significant leakage in some systems Inflow of stormwater can cause outflow for sewage Balancing conflicting objectives of cost, and minimizing damage to the environment a key issue
—reticulation	Comprising pipes or constructed channels with pumping stations and rising mains as required	Pumping stations and associated rising mains	Formed channels—many variants of shape and material Structure Pumps and controls Cast iron, steel	Long Medium		
—sub-mains and carriers		As above				
—major sewers		As above				
3. Treatment	Treatment plants—conventionally: Primary	Process sub-systems Screening Flotation Sedimentation	Containing structures Installed machinery	Medium Medium	Structures outlast machinery—functional obsolescence is limiting factor—not expiry of life	Varies between organisation
	Secondary	Trickling filters Extended aeration, activated sludge Filters Oxidation ponds	Controls and instrumentation	Short	Designed with bypass acceptable, risk redundancy poor	
	Tertiary	Plant contact Chemical dosing				
4. Disposal and reuse	Release into environment	Coastal cities: minimal treatment, ocean outfalls Inland cities: medium treatment, disposal to rivers		Functionally obsolete	Cheapest solutions once good enough; currently, dispersal through ocean discharge not acceptable. Community expectations are for re-use	

[a] Pressure pipes can be further classified in terms of size, significance, and accessibility.

SCHEDULE 2

WATER SUPPLY INFRASTRUCTURE
MAIN FUNCTION AND DOMINANT TECHNOLOGIES

Major functions	Principal method	Main technologies	Technology subgroup	Life years	Initial assumptions/ changed expectations	Probable status of knowledge of physical condition
1. Harvesting[a]	Surface run-off; snow and ice melt	Maintained natural environment				
	Ground water	Aquifer management				
	Reuse Desalination					
2. Bulk storage	Lakes and impounded rivers	Major dams	Concrete gravity Concrete arch Rock or earth	Indefinite except where defective	Early dams known to be structurally defective and under-designed for floods by present standards	Worldwide interest in dam safety has forced reviews. Unlikely that principal issues not being addressed. Safety status will be known
		Ancillary Systems	Flood controls, Outlet systems Power generation Small dams	Long		
	Run of river	Weirs		Medium or long		
		Pumping	Screens, pumps Ancillaries	Short to medium		
	Ground water	Bores				
3. Treatment	Full process plants; Limited function plants	Process subsystems	Containing structures —concrete —steel Installed machinery	Medium	Structures outlast machinery—functional obsolescence is probably limiting factor—not expiry of life	Varies between organizations
	In system processes	Screening chemical dosing	Controls and instrumentation	Medium		
	Point of use treatments	As required by consumer		Short		

4. Transport —Bulk	Conduits —channels	Constructed channels open or in non-pressure tunnels	Channels Tunnels	Long	Originally designed for quantity—quality now dominates. Algae growth and surface run-off Public safety	Existence of monitoring program readify determined
	—major pipelines[b]	Large pipelines	Above-ground pipes —steel —other	Long to indefinite	Early jointings and support methods can give ongoing problems. Critical valves may not survive practical operation	These pipes will be accessible with any management deficiencies known or determinable
—Distribution	—trunk mains	Large pipelines	Buried pipes —steel and variants —cast iron and derivatives —ductile iron —plastics	Long	Inadequate management of external protection, both physical and chemical Lack of internal protection of early materials. Wide variances in actual life	Buried pipes present the bulk of the maintenance cost and most complex management
—Reticulation	—minor mains	Large, medium, small pipelines				

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[a] The harvesting function is integrated with total catchment management and is beyond the scope of this summary of constructed physical infrastructure.

[b] Pressure pipes can be further classified in terms of size, significance, and accessibility.

rate of return targets for government trading enterprises, may have created incentives for government agencies to reduce expenditure on 'back-up' facilities or 'system redundancy'—what some have disparagingly referred to as the 'gold-plating' of infrastructure. The merits of such an approach to asset valuation have been canvassed elsewhere (Walker *et al.*, 2000). Introduction of a system of reporting engineering information could well highlight the risks facing public sector agencies (and the community) through under-spending on measures promoting reliable service delivery.[5]

SUMMARY

This article initially describes options for reporting on public sector infrastructure. The major options either involved balance sheet 'recognition' of some form, or non-recognition and supplemental disclosures about amounts which might be spent on maintaining, restoring or upgrading infrastructure assets. Each of these options has had its proponents over the past hundred years or more, but many contributors to the accounting literature have been better at recycling ideas than resolving problems.

The article has assessed the merits of major options for reporting on infrastructure using a three-step process. First, analysis was made of the contribution each might make towards communicating information to potential users of information about matters which (it was hypothesized) are *relevant* to the judgments they are likely to make. Second, the likely *reliability* of information generated by each option was evaluated. Finally, the issue of data *comparability* was addressed.

The findings suggest that some bold claims have been made about the likely relevance to users of different forms of financial statement disclosures involving one or other valuation method. These claims do not stand up to analysis. Rather, users of reports on infrastructure (it is hypothesized) are likely to be concerned most about the physical condition of those assets, and proposed or projected cash flows associated with their use, repair or modification as well as qualitative information concerning assumptions made about system functionality requirements. This information cannot be conveyed by simplistic dollar value historical cost accounting, replacement price accounting, deprival value accounting, renewals accounting, CBD or the double account system. Proposals to establish provisions for deferred maintenance are perceived to be adjuncts to many of those financial accounting proposals. They ultimately involve making heroic assumptions about future asset use and technological change and political priorities—and even then the resulting data do not provide a solid base for external users to assess past stewardship of infrastructure or likely obligations for future generations if that infrastructure is to be retained.

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[5] Experience in Australia and New Zealand in the later 1990s has highlighted risks associated with system failure of key infrastructure. In Auckland the failure of electricity transmission lines led to power outages for all but essential services for an extended period. Similar problems were experienced in Brisbane and Sydney. Melbourne suffered a loss of gas supplies for many weeks after the failure of a privately owned gas plant, Sydney experienced two periods of alerts about the quality of drinking water after testing suggested high levels of contamination in a privatised water treatment plant. Subsequently it was established that testing procedures were faulty, but not before it was found that the design of the treatment plant meant that water supplies could not bypass the suspect equipment, and that filters could not be flushed without diverting suspect organisms back into the water supply.

This analysis suggests that the optimal form of reporting on infrastructure involves a careful combination of supplementary financial and non-financial disclosures. The latter in turn needs to incorporate a combination of condition ratings for assets of differing economic lives, statements of assumptions about future asset utilization, and proposed or projected cash flows on future maintenance and upgrading work taking account of society's expectations about system functionality.

Walker *et al.* (2000) suggested that while there may be a good case for the valuation of infrastructure based on current replacement values, it may be counterproductive to undertake frequent reviews of those asset valuations since this would reduce the usefulness of financial indicators for cross-sectional and longitudinal analyses of performance. The analyses and tentative conclusions formed here are consistent with those earlier observations, insofar as they relate to asset valuation practices and financial reporting.

As for non-financial disclosures, their design might have regard to the key components of infrastructure, to dominant technologies, and to variations in likely economic lives of infrastructure elements. Schedules 1 and 2 present some illustrations of the way such condition assessments might be organized. These illustrations were based on the circumstances of two major Australian agencies responsible for water distribution and wastewater disposal and treatment respectively. These illustrations are speculative. Different considerations might apply to other forms of infrastructure. It is acknowledged that the design of functionality reports may well place particular emphasis on the condition of those components which, were they to fail, could lead to more widespread difficulties or even to overall system failure.

There has been little published empirical research dealing with the attitudes of 'users' towards different forms of accounting and reporting on infrastructure. However, the evidence reported in Van Daniker and Kwiatkowski (1986) provides strong and explicit support for the findings of the analytical work presented in this article. Van Daniker and Kwiatkowski were almost dismissive of their findings that potential users of public sector reports indicated that they would place great significance on 'engineering data', since their study was concerned with financial reporting.

Ultimately a system of financial calculation and reporting cannot perform the impossible, by providing valuations, which are meaningful substitutes for qualitative engineering information relating to an asset's functionality. Public sector infrastructure reporting is an apt illustration of the interdependency of financial and engineering disclosures when functionality is the focus.

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Motivating Truthful Upward Communication of Private Information: An Experimental Study of Mechanisms From Theory and Practice

In the absence of incentive-compatible control mechanisms, subordinate managers may misrepresent private information to advance their self-interests at the expense of the firm. Analytical research has proposed incentive mechanisms to motivate truthful upward communication of private information. Yet incentive mechanisms observed in practice seldom are as complex as those proposed by theoretical research. This study contributes evidence that may help to explain this divergence between theory and practice, and for identifying potential directions for the further development of both. In a laboratory experiment, four control mechanisms—two suggested by analytical research, and two proxying for practice—were tested. Both analytically derived mechanisms were found to reduce subordinate misrepresentations relative to the reportedly common linear profit-sharing arrangement. However, superiors who were allowed to use costly and imperfect audits, and who could exercise subjective judgment, outperformed all of the other mechanisms at inducing truth-telling, though this superior truth induction did not translate into a significantly lower level of firm losses from suboptimal project selections. Results also indicated that none of the mechanisms tested was able to eradicate subordinate misrepresentations and the profit losses that they induced. Together, these findings provide a possible explanation for the analytically derived mechanisms' lack of real-world adoption. Further, they suggest ways for both theory and practice to advance through more extensive cross-fertilization.

Key words: Incentives; Resource allocation; Truthful communications.

Resource allocations within decentralized firms often rely on information supplied by sub-unit managers. In the absence of incentive-compatible control mechanisms, self-interested managers may misrepresent private information at the expense of the firm (Dye, 1983; Penno, 1984; Radner, 1986). Analytical research has thus proposed pay schemes to motivate truthful representations by subordinates. Yet incentive systems observed in practice seldom are as complex as those proposed by

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theoretical research (Arrow, 1985; Holmstrom and Milgrom, 1987; Baker *et al.*, 1988). This study seeks to contribute evidence that may help to explain this divergence between theory and practice, and for identifying potential directions for the further development of both.

Experimental tests are performed on the relative effectiveness of four mechanisms for inducing truthful subordinate communications in a resource allocation context. As predicted, two incentive pay schemes proposed by analytical research reduced subordinate misrepresentations relative to the linear profit-sharing approach that is reported to be common in practice. Consistent with the analytic genesis of these schemes, superiors were limited to relying mechanistically on subordinates' communicated information for the current period. Yet in real life, employment settings tend to be characterized by frequent and prolonged interpersonal interactions, and superiors can employ multiple controls and exercise judgment based on past experiences with subordinates. Multiperiod settings also bring into play factors such as reputation effects and social pressure (Kanodia *et al.*, 1989; Waller, 1994). Therefore, we also tested an additional proxy for practice, one which permitted a non-mechanistic superior to exercise subjective judgment and to choose costly and imperfect probabilistic audits. This proxy was found to reduce subordinate misrepresentations not only relative to the linear profit-sharing scheme, but also relative to the most effective analytically derived mechanism. Further analysis revealed, however, that this superior truth-inducing property was not associated with a significantly lower level of firm losses after taking audit costs into account.

Together, the findings suggest that research on truth-inducing mechanisms can advance by considering the joint effects of multiple controls and incorporating more of the factors (e.g., learning, interpersonal dynamics) that operate in multiperiod, real world employment settings. And since participants in this experiment were unable to eliminate subordinate misrepresentations using simple controls and the linear profit sharing scheme, practice can potentially benefit from more extensive experimentation with the mechanisms proposed by analytical research. Such cross-fertilization is desirable because none of the mechanisms tested—whether from theory or practice—was able, by itself, to eliminate subordinate misrepresentations and the firm losses that they caused.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A large number of analytical studies have sought to develop pay schemes to align the interests of subordinate managers and the firm. This literature has considered a wide range of subordinate behaviours, including work effort, short versus long term focus, risk taking, and truth-telling (Baiman, 1982, 1990; Radner, 1986; Levinthal, 1988; Young and Lewis, 1995). Among the schemes aimed at motivating subordinate truth-telling, that proposed by Groves (1973, 1976) has generated particular interest in theoretical and empirical studies (Green and Laffont, 1977; Groves and Loeb, 1979; Jennergren, 1980; Waller and Bishop, 1990, Chow *et al.*, 1994a, 1995). Under the Groves (G) scheme for a two-subordinate setting, a subordinate manager's pay is an increasing function of the performance measure used:

$$G_i = A_i(K_i) + P_j(K_j) - C \qquad (1)$$

where G_i = Manager i's performance measure,
$A_i(K_i)$ = Manager i's actual output given resources provided, K_i,
$P_j(K_j)$ = Manager j's projected output given resources provided, K_j, and
C = Total cost of resources $K_i + K_j$.

Groves and Loeb (1979) have demonstrated analytically that, in a one-period setting without collusion among risk-neutral subordinates, the dominant strategy for each subordinate under the G scheme is to communicate private information truthfully.

Three studies have empirically tested the G scheme in a two-subordinate setting. Waller and Bishop (1990) examined subordinates' communication of private information about the expected ratio of outputs to the amount of resources made available (the 'p-ratio'). They compared misrepresentations of the p-ratio between the G scheme and two alternatives: (a) a 'unit profit' (UP) scheme, which paid a fixed amount per unit of reported realized profit, and (b) a 'unit profit-plus-penalty' (UPP) scheme, under which pay also varied linearly with realized profit, but was reduced to zero whenever the actual p-ratio fell short of the subordinate's stated expectation. Misrepresentations under the G scheme were found to be significantly lower than under the UP scheme, but significantly higher than under the UPP scheme.

Chow *et al.* (1994a) noted that because state uncertainty was absent in Waller and Bishop's experiment, no misrepresentation of the p-ratio could avoid detection and the UPP scheme's large penalty. But in a decentralized firm where subordinates have private information, it is unlikely that superiors could perfectly detect subordinates' misrepresentations, nor is it likely that subordinates' pay would be reduced to zero for a performance shortfall of any size. Thus, Chow *et al.* argued that Waller and Bishop's UPP scheme was too extreme a benchmark for evaluating either real world practice or the mechanisms proposed by analytical research.

Instead of reporting a single p-ratio, subjects in Chow *et al.*'s (1994a) experiment reported a vector of p-ratios for alternate resource allocation levels. This specification permitted distinguishing between 'direct' and 'indirect' misrepresentations. Chow *et al.* defined the former as misrepresentations of the p-ratio for the resource allocation level which maximized the subordinate's actual profits (while lowering total firm profits); and the latter as misrepresentations related to the subordinate's less preferred allocation levels. As predicted, both types of misrepresentations occurred significantly less frequently under the G scheme than under either (a) a 'linear profit sharing' (LPS) scheme equivalent to Waller and Bishop's UP scheme, or (b) an analytically derived truth-inducing scheme for single-subordinate settings. However, misrepresentations under the G scheme were still common.

Chow *et al.* (1995) used Chow *et al.*'s (1994a) communication task and introduced a probabilistic management audit. Such a direct intervention by the superior has been analytically shown to deter subordinate misrepresentations (Magee, 1980; Anderson and Young, 1988). Chow *et al.* (1995) found that, as compared to the G scheme, misrepresentations were significantly less frequent when the LPS scheme was paired with a probabilistic audit. However, like the other two studies, none of the controls tested was able to eliminate subordinate misrepresentations.

Thus, Waller and Bishop (1990) and Chow *et al.* (1994a, 1995) have increased our understanding of the truth-inducing properties of several controls. But for purposes of advancing theory and practice, the findings of these studies are limited by four considerations. First, as these studies acknowledge, the numbers of experimental periods used may have been too low for subjects to fully develop communication strategies under the more complex mechanisms. Second, even though the G scheme has been analytically shown to be truth-inducing, more recent analytical research has proposed promising alternatives that have yet to be tested (e.g., Osband and Reichelstein, 1985; Banker and Datar, 1992; Kanodia, 1993). Third, a superior typically has multiple means of controlling and motivating subordinates (e.g., audits, selection, socialization, rules and procedures) (Chatman, 1989; Flamholtz *et al.*, 1985; Merchant, 1989; Simons, 1991, 1992), and a combination of these mechanisms may prove to be effective at inducing truthful subordinate communications. Yet neither Waller and Bishop (1990) nor Chow *et al.* (1994a) examined controls beyond incentive pay schemes. Even though Chow *et al.* (1995) did test the effects of probabilistic audits, their costless and perfect audits are unlikely to have real world counterparts. Fourth, all three studies have used a series of independent one-period settings where the superior was restricted to relying mechanistically on information provided by subordinates in the current period. While this approach is consistent with the analytical research underlying the truth-inducing pay schemes tested, it fails to capture the multi-period nature of real world employment relationships, where both superiors and subordinates can learn from past experiences (Pondy and Birnberg, 1969; Baron and Besanko, 1987; Baiman, 1990; Young and Lewis, 1995).

The current study incorporates several features aimed at ameliorating these limitations. One feature retained from the related prior studies is use of the LPS scheme as a baseline for evaluating the other control mechanisms. Waller and Bishop (1990) and Chow *et al.* (1994a) have shown that, in a one-period setting where the superior cannot make use of past experiences, the subordinate's optimal communication strategy under the LPS scheme is to maximally overstate all projects' p-ratios.

A departure from the earlier studies expands the number of experimental periods to twenty, thereby ensuring subject understanding of the control mechanisms for developing a communication strategy.[1] Second, the set of analytically derived pay schemes tested is expanded beyond the G scheme to include an approach proposed by Osband and Reichelstein (1985). Third, a proxy for practice is added, wherein the superior is allowed to exercise subjective judgment based on past experience, and to conduct costly and imperfect audits of subordinate communications. More detailed discussions of the added control mechanisms are provided below.

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[1] In contrast, Waller and Bishop (1990) had used ten periods, while Chow *et al.* (1994a, 1995) had used nine periods.

The Osband and Reichelstein (OR) Scheme

While all of the analytically derived pay schemes are reasonable candidates for testing, we chose the OR scheme for two major reasons. One is its relative simplicity, as ease of operationalization and understanding are major considerations in managers' choice of controls (Merchant, 1989). OR is simpler than the G scheme in that the former evaluates each subordinate based only on the subordinate's own communicated information and actual outcomes, rather than also on other subordinates' communicated information. Second, while OR is similar to Waller and Bishop's UPP scheme both in form and in using a performance measure which varies linearly with actual output, it does not impose the latter's extreme penalty for profit shortfalls. This feature makes it a more reasonable candidate for practice than the UPP scheme. Kirby *et al.* (1991) have shown analytically that an OR-based pay scheme increases subordinates' motivation to truthfully communicate private information.

Various forms of the OR scheme may be used. The simple quadratic form is used in this study because it is relatively easy to understand:

$$P = (B^2 + 2B(A - B))(K) - (K) \tag{2}$$

where P = Performance measure,
A = Actual p-ratio revealed ex post,
B = Communicated p-ratio adopted as the performance standard, and
K = Resources allocated.

A Non-Mechanistic Superior (NMS)

For tractability, the analytical models used to develop truth-inducing mechanisms typically assume a one-period setting. Yet in reality, both superiors and subordinates learn from experience and can strategically base decisions on multi-period observations of behaviour. Holmstrom (1979), Fama (1980), and Baron and Besanko (1987) have suggested that superiors' access to and use of subordinates' performance history may mitigate dysfunctional behaviour by the latter. Accordingly, the current study extends empirical testing to a multi-period setting, albeit only in an *ad hoc* fashion. A subset of superiors (NMSs) is permitted to operate in a non-mechanistic fashion, to conduct costly and imperfect audits of subordinates' project proposals at their own discretion, and to allocate resources based on the audit findings, subjective judgments, and past experience with subordinates who are paid under an LPS scheme. NMS will proxy for practice in subsequent discussion.

Hypothesis

Based on the above discussion and prior studies' findings (especially related to the simple LPS scheme), all three alternatives to the simple LPS scheme are posited to reduce the frequencies and magnitudes of subordinate misrepresentations:

H1: Subordinates' misrepresentations of p-ratios are less frequent and smaller in magnitude under G, OR, and NMS than under a simple LPS scheme.

While H1 is useful for focusing the empirical analysis, it is silent on the relative frequencies and sizes of misrepresentations across control mechanisms. Deriving comprehensive predictions among these mechanisms is handicapped by the lack of analytical work in respect of the role of these factors. Nevertheless, there is sufficient basis for the following predictions.

First consider the two analytically derived schemes. In the case of the G scheme, prior research has shown that it can be circumvented by subordinates coordinating their communications and simultaneously reporting upwardly biased p-ratios (Bennett and Conn, 1977; Waller and Bishop, 1990). At the extreme, collusive behaviour can lead to subordinates maximally overstating all p-ratios. Such an outcome would be indistinguishable from that predicted under LPS. But collusion of this type is unstable because defecting from the collective agreement when others are in compliance can benefit the defector, especially when there are costs for subordinates to police each other's misrepresentations (Chow *et al.*, 1994a). Hence, it is expected that the G scheme will not totally suppress subordinate misrepresentations. And there is an expectation of cases of subordinates simultaneously *over*stating their projected p-ratios, though such occurrences should be less frequent than under the LPS scheme.

Under the OR scheme and for a given amount of allocated resources, a subordinate manager's performance measure is maximized by truthfully reporting p-ratios. This is because any deviation between the actual and communicated p-ratios (A and B in equation (2)) reduces the multiplier applied to each unit of resource.[2] However, an overstated p-ratio may have the additional effect of increasing the amount of resources allocated to the subordinate, and this increase may more than offset the per unit penalty imposed for the overstatement.[3] Thus, misrepresentations would still be expected to occur under OR in the form of *over*statements. Relative to the G scheme, however, such overstatements are expected to be smaller in magnitude due to the OR scheme's penalty factor.

Considering NMS, the truth-inducing effectiveness of this treatment relative to G and OR is subject to countervailing influences. NMS has the advantage of (costly and imperfect) audits, a non-mechanistic superior and the use of prior-period information. But G and OR have the edge of mirroring potentially more truth-inducing pay schemes. Given the lack of guidance from the analytical literature on the relative deterrent effects of these various control system attributes, the relative effectiveness of NMS versus G and OR is left open as an empirical question.

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[2] In equation (2), the performance measure, P, increases with the multiplier $(B^2 + 2B(A - B))$. The value of this term is at its maximum when B (the communicated p-ratio) equals A (the true p-ratio). To see this, assume that B deviates from A by the magnitude 'a' (i.e., $B = A + a$). Expanding the multiplier term yields $(A + a)^2 + 2(A - a)(A - A - a) = A^2 + 2Aa + a^2 - 2Aa - 2a^2 = A^2 - a^2$. The maximum value is obtained when $a = 0$, or when $B = A$.

[3] Continuing with the illustration in note 2, suppose that the overstatement ('a') increases the amount of resources allocated to a subordinate from K to $K + k$. The first term on the right-hand side of equation (2) would become $(A^2 - a^2)(K + k)$, or $A^2K + A^2k - a^2K - a^2k$, as compared to A^2K in the absence of misrepresentation. The difference, $A^2k - a^2K - a^2k$, can be decomposed into two parts. The first component, A^2k, is the gain from getting k additional units of resources. The second component, $-a^2(K + k)$, is the penalty for the overstatement. If the gain in resources is sufficiently large, it can more than make up for the overstatement penalty.

METHOD

Subjects

The subjects were 108 students recruited from undergraduate business classes at two urban universities. During recruitment, subjects were told that they would earn cash based on their performance in a management simulation. They were not told the nature and objective of the experiment.

Experimental Design

The experiment was a factorial design with two between-subjects factors. These were a control mechanism with four levels (LPS, G, OR, and NMS), and a divisional manager factor with two levels (A and B).

Task

The experimental task involved allocating resources between two divisional managers. LPS, G, and OR were each randomly assigned twenty-four subjects, who formed twelve pairs of divisional managers. In contrast, NMS was randomly assigned thirty-six subjects, who formed twelve triads of one non-mechanistic superior and two subordinate divisional managers. Each subject pair in LPS, G, and OR also had a superior, but this (mechanistic) role was assumed by a research assistant.

In each of twenty experimental periods, the superior allocated a limited amount of resources (300 units) between the two divisional managers to maximize their combined expected net output. Each divisional manager communicated to the superior the projected p-ratios (i.e., ratios of output to input) for three projects. All projects required 100 units of resources; thus only half of each period's six proposed projects could be funded. Under LPS, G, and OR, the superior mechanistically based project selections on the divisional managers' communicated p-ratios for the period. Under NMS, the superior was allowed to audit any number (zero, one, two, or all three) of each divisional manager's projects. Each project audit had a pre-specified cost and only imperfectly revealed the actual p-ratio.[4] To motivate non-mechanistic superior maximization of total expected net output, payment to the superior was a fixed share of the two divisions' combined actual net output minus audit costs. The divisional managers under each control mechanism were informed of their superiors' options.

Subjects were paid cash based on their performance measures and assigned control mechanisms. Each subject's pay in experimental dollars was translated into cash at a pre-specified rate. This rate was known to the subjects prior to commencing the communication task. The translation rates differed across cells to yield the same \$.75 expected cash pay for each communication period assuming truthful communication.[5]

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[4] The imperfect audits cost eight units of resources each and were operationalized as follows. For every project in every experimental period, an adjustment factor was randomly generated from a symmetrical distribution with a mean of 1 and a range of .9 to 1.1 in increments of .01. The probabilities for the possible values were set at 1/165 for .9, 2/165 for .91, 3/165 for .92, . . . , 9/165 for .98, 10/165 for .99, 55/165 for 1, 10/165 for 1.01, 9/165 for 1.02, . . . , 3/165 for 1.08, 2/165 for 1.09, and 1/165 for 1.10. Each project's actual p-value was multiplied by its adjustment factor to produce an 'audit finding'. Thus, the audit finding revealed the actual p-ratio on average, but was subject to error on individual projects. Both divisional managers and the superior knew these distributional properties.

Procedure

All subjects randomly scheduled for a given time slot were assigned to the same control mechanism. (Typically six to nine subjects were scheduled per time slot.) The experiment took about three hours and was comprised of three steps.

Step One: Upon arrival, the subjects were randomly assigned to a manager position (labelled A and B) and directed to a room for that position. For LPS, G, and OR, one research assistant acted as the superior for every two pairs of subjects. For NMS, one subject was randomly assigned to the role of the non-mechanistic superior for every pair of divisional managers. To limit the potential for tacit collusion, subjects were not told whom they were matched with in the experiment.

Upon arrival at the assigned room, each subject was given a packet containing the task instructions. Divisional managers also received twenty sealed envelopes, one for each experimental period. Each envelope contained a communication form and the actual p-ratios for that period's three projects. Each subject also received a form which could be used to monitor decisions and outcomes. The subjects were told not to open any of the materials until instructed to do so.

Step two: Subjects read through the experimental instructions, which provided detailed explanations of the experimental task and the assigned pay scheme, as well as examples of how various combinations of subordinates' communication choices and superiors' auditing selections (for those assigned to the NMS treatment) could affect project funding decisions. Subjects then completed a set of numerical exercises relating to key aspects of the experimental task. Correct answers were provided at the end of each exercise. Afterwards, the subjects completed six fictitious lotteries aimed at assessing their risk preferences.[6]

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[5] The translation rates were \$1 in cash for each 144 units earned for the divisional managers in LPS and NMS, \$1 for 288 units for G divisional managers and NMS central managers, and \$1 for 397 units for OR divisional managers. These different translation rates adjusted for differences in how the mechanisms translated output into units of performance so as to produce the same expected cash pay per period under truthful communication. A limitation of this approach is that a misrepresentation of a given size would have different cash, and thus potential incentive effects, across experimental treatments. But using the same translation rate across mechanisms also would produce unequal cash incentives, but in the opposite direction. This limitation needs to be borne in mind in interpreting the results. As will be discussed below, even though NMS paid divisional managers the highest level of cash per unit of misrepresentation, it still produced the lowest frequencies and magnitudes of misrepresentations.

[6] We included a risk preference measure because prior analytical research has suggested that subordinate behaviour is a function of this characteristic. Each subject was asked to specify the amount of money that would induce personal indifference between taking that amount for certain and taking each of six fictitious simple lotteries. As it turned out, efforts to explore risk preference effects were hampered by inadequate sample sizes. In the case of NMS, for example, because the probabilistic audits imposed risk on the divisional managers, their risk preferences may be especially relevant to their communication strategies. But because the paired divisional managers were competing against each other, tests required subject pairs that had the same risk preference characteristic. In the case of risk averse subjects, NMS had only one such pair. All remaining pairs were mixed in terms of risk preference (e.g., one was risk neutral and the other was risk averse). Similar problems were encountered with the other cells. Given the inadequate sample sizes, further discussion of risk preference effects is omitted.

Step Three: The subjects completed 20 experimental periods, with each period structured as follows:

1. Each divisional manager opened the information envelope for the period and privately observed the three actual p-ratios. Then they wrote on their communication form a p-ratio for each project to be given to the superior. Both divisional managers and the superior knew that the p-ratios were uniformly distributed between 1.00 and 2.00 in increments of 0.01.[7]
2. The superior collected the communication forms. Under LPS, G, and OR, the superior mechanistically selected the three projects out of six with the highest communicated p-ratios (the subjects were aware that ties would be broken by flipping a coin). Under NMS, the superior (a subject) pre-selected which, if any, of each divisional manager's projects to audit. This choice was revealed to each divisional manager when collecting the latter's communication form, and the divisional manager was required to reveal the 'audit finding(s)' for the selected project(s) (cf n. 4).[8] The superior was allowed to apply whatever criteria considered appropriate to select the three projects to fund.
3. The superior marked on each divisional manager's communication form which, if any, of that manager's project(s) had been selected for funding. Then the forms were returned. To enable the divisional managers under the G scheme to compute their performance measures, they also were given the communicated expected net output of their paired managers' funded project(s).

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[7] Twelve different sequences of twenty p-ratio triads were generated for each divisional manager position. Each sequence was used four times, once for each of the twelve 'firms' under each control mechanism. These sequences were generated as follows. First, sixty p-ratios were randomly generated using a uniform distribution with a range of 1.00 to 2.00. Increments of .01 were used. These p-ratios were randomly grouped into twenty sets of three. Next, a duplicate set of these twenty triads was created and randomly matched to the original set. The result was twenty sets of paired triads. One set from each pair was assigned to one of the two divisional managers in each 'firm'. In the experimental design, the first fifteen experimental periods were reserved for subject learning, periods 16 to 19 were to be used for hypothesis testing, and period 20 was to be discarded to control for end-period effects. Consistent with this, the twenty sets of paired triads were divided into three subsets with fifteen, four, and one member(s), respectively. The first subset was assigned to the first fifteen experimental periods, the second to periods 16–19, and the third to period 20. A different random sequence of the former two subsets was used for each 'firm'. Thus, for example, Manager A of 'firm' number one under each of the four control mechanisms got the same sequence of triads. Manager B of the same 'firm' got a different sequence from that given to Manager A, but this sequence was the same as that given to the other control mechanisms' Manager Bs with the same 'firm' number.

[8] A more powerful, and perhaps realistic, treatment is for the superior to make his/her audit selections based on the communicated p-ratios (e.g., audit the projects with the highest communicated p-ratios). We did not adopt this approach because it would have increased the time requirement of the experiment to far more than the current three hours. In addition, superiors in real world settings probably have access to much more than the 'audit findings' type of information relating to subordinates' submitted projections. Rather, they also can examine details such as the components of plans, the factors considered in making projections, and the assumptions about the nature and values of relevant factors. They also may actively participate in the process of project planning and forecasting, rather than being simply presented with the final figures (Shtub *et al.*, 1994; Kerzner, 1998; Shields and Shields, 1998; Gido and Clements, 1999). Since it was infeasible to capture these rich details of management audits and processes in an experimental setting, our treatment only begins to reflect the potential effects of management audits. This limitation has to be borne in mind in interpreting the results.

At the end of the twentieth period, the subjects completed a post-experimental questionnaire which contained several manipulation check questions (see below). They were paid after their earnings had been verified.

RESULTS

Manipulation Checks

Responses to the exit questionnaire indicated that the subjects in all cells had high levels of task involvement (Table 1). Both the intended information asymmetry between divisional managers, and that between divisional manager and the superior, appear to have been achieved. Also as expected, the subjects under LPS considered their pay contract to penalize them much less for a misrepresentation than each of the other three contracts, as assessed by Scheffe's multiple comparisons at an overall alpha level of .05.

Descriptive Statistics

The means (standard deviations) of the divisional managers' cash earnings were as follows: LPS: $13.20 ($4.22); G: $14.36 ($2.12); OR: $13.24 ($1.99); and NMS, $13.86 ($2.22). These means did not differ significantly across control mechanisms.

To concentrate on steady state behaviour, the subjects' responses to an exit question were used to identify the period by which each had developed a stable communication strategy. Table 2 is based on these self-reported data. It indicates that G had one pair of subjects where both reported having developed a strategy as early as period 2, and across all four control mechanisms, a total of nineteen pairs reported having attained this state by period 5. At the other extreme, while all pairs reported having developed a stable strategy by period 16, nine pairs just met this schedule. This finding is supportive of the need for increasing the number of

Table 1

MEANS (STANDARD DEVIATIONS) OF RESPONSES TO MANIPULATION CHECK QUESTIONS

	LPS	G	OR	NMS
1. To what extent did you make your decisions as if you were actually involved in a real business situation?	7.67 (1.52)	7.25 (1.94)	6.92 (1.82)	7.13 (2.31)
2. How much did the other division manager know about your actual p-ratios right after sending your messages in each round?	1.63 (1.50)	3.0 (2.19)	1.83 (2.18)	2.83 (2.42)
3. How much did the central manager know about your actual p-ratios right after sending your messages in each round?	1.50 (1.32)	3.71 (2.69)	2.64 (2.77)	3.71 (3.08)
4. To what extent did your pay contract penalize you for submitting a projected p-ratio different from the actual p-ratio?	2.88 (2.49)	4.63 (2.68)	5.33 (2.82)	4.50 (2.59)

Note: Response scale: 1 = 'not at all'; 10 = 'totally'.

Table 2

NUMBER OF MANAGER PAIRS REACHING STEADY STATE COMMUNICATION STRATEGY BY PERIOD

Control mechanism	Period 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
LPS	0	0	2	1	1	2	2	0	1	0	0	0	0	0	0	3	0	0	0
G	0	1	0	2	3	2	1	1	0	0	0	0	0	0	0	2	0	0	0
OR	0	0	2	0	2	3	0	0	0	3	0	1	0	0	0	1	0	0	0
NMS	0	0	0	1	4	1	0	0	1	2	0	0	0	0	0	3	0	0	0
Total for period	0	1	4	4	10	8	3	1	2	5	0	1	0	0	0	9	0	0	0
Cumulative total	0	1	5	9	19	27	30	31	33	38	38	39	39	39	39	48	48	48	48

Table 3

NATURE OF P-RATIO COMMUNICATIONS IN STEADY STATE

Control mechanism	Truthful representation	Misrepresentation	Nature of misrepresentation	
			Overstatement	Understatement
LPS	117 (13.8%)	732 (86.2%)	724 (98.9%)	8 (1.1%)
G	286 (32.2%)	602 (67.8%)	168 (27.9%)	434 (72.1%)
OR	197 (26.9%)	535 (73.1%)	498 (93.1%)	37 (6.9%)
NMS	314 (39.3%)	484 (60.7%)	361 (74.6%)	123 (25.4%)

learning periods over prior studies. If the approach of the three related prior studies had been followed (Waller and Bishop, 1990, used all ten periods' data while Chow *et al.*, 1994a, 1995, allowed three or five learning periods), then over half of the communicated p-ratios used in this study's statistical analysis would not have reflected a steady state communication strategy.

Table 3 shows how the reported p-ratios under each control mechanism were distributed among truthful representations, overstatements, and understatements in steady state.[9] Misrepresentations are most common under LPS (86.2 per cent), and almost all of these (98.9 per cent) are overstatements. Among the remaining mechanisms, NMS has the highest proportion of truthful representations (39.3 per cent), G is several percentage points lower, and OR is the lowest. Directionally, overstatements are about three times as frequent as understatements under NMS (74.6 per cent versus 25.4 per cent), whereas the opposite is observed under G (27.9 per cent versus 72.1 per cent). OR is similar to LPS in that most of the misrepresentations are overstatements.

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[9] Thus, if one pair of subjects had reached steady state by period 6, its data from periods 6 to 19 were used. Another pair which reached steady state by period 9 would be included from periods 9 to 19.

TABLE 4

SELECTED DISTRIBUTIONAL STATISTICS FOR RELATIVE MISREPRESENTATIONS OF P-RATIOS IN STEADY STATE

	Control mechanism			
	LPS	G	OR	NMS
Mean	.659	.225	.412	.138
Median	.720	.110	.380	.095
Std dev.	.341	.270	.312	.152
Minimum	0	0	0	0
Maximum	1	1	1	1

Following Waller and Bishop (1990), a relative misrepresentation (RM) measure was constructed for each communicated p-ratio. This measure captured the extent of misrepresentation out of the total amount possible, and was computed as follows. First, the absolute value of the difference between the actual and communicated p-ratios (labelled AD) was obtained. Then, for an overstatement, RM = AD/(2.0 minus the actual p-ratio); for an understatement, RM = AD/(the actual p-ratio minus 1.0); and for no misrepresentation, RM = 0.[10]

Table 4 presents selected distributional statistics for RM in steady state. It shows that both mean and median RM are highest under LPS (.659 and .72). OR and G are next highest, in that order, with NMS having the lowest values for both (.138 and .095).

Hypothesis Tests

H1 had stated the prediction that misrepresentations would be both less frequent and smaller under all three alternatives to the simple LPS scheme. The frequency difference was as predicted and significant ($\chi^2 = 24.59$, 1 df, $p < .001$). The predicted magnitude difference also was found. Scheffe's multiple comparisons indicated that RM under LPS was significantly higher (at an overall alpha level of .05) than each of the other mechanisms.[11]

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[10] It was not appropriate to compare the absolute values of misrepresentations across mechanisms because a different random sequence of paired p-ratio triads had been given to each manager pair under each treatment (cf n. 7). Since many pairs had attained steady state in different periods, the absolute sizes of their misrepresentations were not comparable because the maximum possible amounts of misrepresentations depended on how far the actual p-ratio was from 2.0. (Consider an actual p-ratio of 1.7 vs. 1.2.) We did compute absolute misrepresentation for periods 16–19, in which all subjects had faced the same four sets of p-ratio triads (in different random order). The results were qualitatively identical to those based on relative misrepresentations in steady state.

[11] For all tests of differences in means that are reported here and later, nonparametric counterparts of parametric tests also were performed to the extent possible. Thus, whenever Scheffe's multiple comparisons were applied, we also conducted Kruskal Wallis analysis of variance across all cells, together with paired-cell comparisons using Wilcoxon rank sum tests. Such a combination was used because the outputs of the former do not indicate which cells differ significantly from which other, while the latter do not include a correction for familywise error. In all cases where the parametric tests yielded significant results, the nonparametric results also were significant.

TABLE 5

SELECTED DISTRIBUTIONAL STATISTICS FOR RELATIVE P-RATIO OVERSTATEMENTS IN STEADY STATE

	Control mechanism			
	LPS	G	OR	NMS
Mean	.753	.359	.570	.245
Median	.960	.265	.610	.180
Std dev.	.338	.328	.328	.215
Minimum	.01	.01	.01	.01
Maximum	1	1	1	1

The earlier discussion also had noted that the divisional managers under LPS could benefit from maximally overstating all of their p-ratios. By and large, they did take advantage of this opportunity. Out of 142 total instances of communications by the LPS manager pairs in steady state, eighty contain simultaneous overstatements by both managers. Tests of proportions confirmed that LPS had a significantly higher proportion of overstatements than each of the other mechanisms at the $p < .001$ level. Table 5 further shows that both mean and median RM for the LPS subjects' overstatements were much higher than those under the other mechanisms, and Scheffe's multiple comparisons indicated that each of the mean differences was significant at an overall alpha level of .05.

Further analyses considered the three LPS alternatives. Under G, none of the misrepresentations was due to both divisional managers having simultaneously overstated all of their p-ratios. Thus, consistent with both Waller and Bishop (1990) and Chow *et al.* (1994a), there was no evidence that the subordinates had succeeded at circumventing the G scheme via collusion.

Turning to OR, it was predicted that this control mechanism would have only a limited deterrent effect on overstatements. Consistent with this expectation, Table 3 shows that after LPS, OR has the highest proportions of both misrepresentations and overstatements, while Tables 4 and 5 show that after LPS, OR has both the highest mean and median RMs for misrepresentations and overstatements. Proportions tests and Scheffe's multiple comparisons tests indicated that both the proportions of misrepresentations and overstatements were lower under OR than LPS, but significantly higher than for the other LPS alternatives.[12]

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[12] Subsequent analysis helped us to realize that this result may in part be due to the parameter values that we had used in the experiment. As we had explained, even though the OR scheme penalizes performance shortfalls, subordinates still can benefit from overstating the p-ratios of low profitability projects, as the latter have little chance of being funded without an overstatement. For the quadratic function used in the experiment, the performance measure P for a project would be positive as long as $A > B/2$. This can be seen from equation (2), where $P = (B(2A - B))(K) - K$. Because the experiment had restricted both A and B to the range 1.0 to 2.0, A could never be less than B/2. Accordingly, subordinates under OR still could gain from overstating their projects' p-ratios. Despite this potential bias against OR's effectiveness, both mean and median levels of misrepresentation still were significantly lower under OR than LPS.

TABLE 6

SELECTED DISTRIBUTIONAL STATISTICS FOR RELATIVE P-RATIO UNDERSTATEMENTS IN STEADY STATE

	Control mechanism			
	LPS	G	OR	NMS
Mean	.147	.297	.212	.197
Median	.130	.130	.145	.080
Std dev.	.111	.350	.188	.263
Minimum	.03	.01	.01	.01
Maximum	.32	1	.71	1

Considering low profitability projects, defined as those with p-ratios equal to or below 1.5, the control mechanisms produced these percentages of understatements in steady state: LPS: 0.48, G: 45.8, OR: 3.72, and NMS: 9.5. Here, a puzzling result is why G would have the highest proportion of understatements overall (Table 3), as well as for low p-ratio projects. A possible explanation is that understating one's own p-ratios lowers the performance measure of the other divisional manager. However, since doing so could disadvantage projects with understated p-ratios, it would only be worthwhile if other valued rewards, such as promotions or public recognition, are based on relative rankings. But no such rewards were included in our experiment. Another potential explanation is that even though the subjects had developed a steady state communication strategy, this was based on an erroneous or incomplete understanding of the G scheme. While this interpretation may have validity for some subjects, it runs counter to the thrust of the other findings that the G scheme had among the lowest frequencies and relative sizes of misrepresentations. Because the high proportion of understatements under G was unexpected, no provision had been made to collect data for exploring its causes. Consequently, such an investigation has to await future research.

Finally, among the three LPS alternatives, NMS had the lowest proportion of misrepresentations (Table 3). Tests of proportions between NMS and G and OR were both highly significant (respectively, $Z = 3.06, 6.53$; $p = .002, .001$). Concentrating on the size of misrepresentations (Table 6), Scheffe's multiple comparisons indicated that NMS's mean value of RM overall, as well as separately for over- and understatements, were significantly lower than for each of the oher mechanisms at overall alpha levels of .05. Thus, the results of testing H1 and the related expectations are consistent with NMS being superior to the other mechanisms at suppressing both the occurrence of misrepresentations and the sizes of those that do occur.

One factor contributing to the superior performance of NMS may have been the selective audits conducted by the central manager. Out of seventy-two p-ratios per period that could be audited (12 manager pairs × 6 reported p-ratios per pair), the mean number of p-ratios audited in periods 1–19 was 9.53 per period, with a range

TABLE 7

SELECTED DISTRIBUTIONAL STATISTICS FOR RELATIVE FIRM LOSSES FROM SUBOPTIMAL PROJECT SELECTIONS IN STEADY STATE

	Control mechanism			
	LPS	G	OR	NMS
Mean	.115	.065	.066	.088
Median	.088	.0	.016	.054
Std dev.	.139	.132	.106	.105
Minimum	0	0	0	0
Maximum	.846	.846	.575	.526

of 4 to 17.[13] Analyses of the patterns of communications selected for audit further revealed that the central managers' audit decisions were responsive to each divisional manager's past pattern of misrepresentations. When the number of communicated p-ratios audited by the non-mechanistic superiors in each period was regressed against the divisional managers' average relative misrepresentation in the prior period, the regression coefficient was positive and significant ($t = 4.62$, $p = .000$, one-tail).[14] When the average relative misrepresentation two periods ago was also included, both coefficients (for periods t-1 and t-2) indicated a positive and significant relationship (respectively, $t = 3.71$, 1.56; $p = .000$, .06, one-tail).

Other Findings

Presumably, subordinates' misrepresentation of private information is of concern because it can reduce firm profitability by inducing suboptimal resource allocations. Conversely, reducing subordinate misrepresentations should increase firm profitability. Because extant theory was insufficiently developed for predicting how the alternate mechanisms would differentially affect profit losses via affecting subordinate misrepresentations, we had refrained from stating a hypothesis for this variable. Still, evidence on the mechanisms' profit effects can provide useful insights for future research. To conduct such an exploration, the optimal firm output for each period (in units of resource) was first determined based on the actual p-ratios. Then the excess of optimal output over actual output from each 'firm's' funded projects was defined as the amount of loss. This amount was then divided by the maximum amount possible to yield a relative loss (RL) measure.

Table 7 presents selected distributional statistics for RL for the steady state periods. It shows that both mean and median RL are highest under LPS. G and

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[13] The number of p-ratios audited per period for periods 1 to 19 were as follows: 15, 17, 10, 9, 14, 8, 17, 14, 5, 5, 7, 7, 10, 12, 8, 7, 6, 4, 6. Thus, as might be expected, more p-ratios tended to be audited in the earlier than later periods, though there was no clear trend in the series.

[14] The same qualitative results were obtained by using the following independent variables: the number of p-ratios misrepresented in the prior period ($t = 2.60$, $p = .01$), and the average absolute misrepresentation in the prior period ($t = 4.32$, $p = .000$).

OR have about equal mean and median levels of RL, while NMS's values are somewhat higher than under these two non-LPS mechanisms.

Scheffe's multiple comparisons indicated that mean RL under G and OR were lower than under LPS at p-levels of .012 and .026, respectively. The comparison between LPS and NMS was insignificant ($p = .484$). An important consideration in the preceding comparisons is that NMS was the only mechanism subject to an audit charge. When the audit costs under NMS were deleted to put it on a more equal footing with the other mechanisms, its mean RL was reduced from .088 to .063, the difference between it and LPS became significant under Scheffe's test ($p = .01$), and it no longer differed from G and OR.

Taken as a whole, the results of testing H1 and the findings relating to firm loss support the following inferences. First, all three alternatives to the simple LPS scheme are more effective than it at suppressing p-ratio misrepresentations by subordinates. These effects differ in size and direction across mechanisms, with NMS being generally superior to the other alternatives. However, there was not a direct correspondence between deterring misrepresentations and reducing firm losses. When audit costs were included, NMS was inferior to the other LPS alternatives at limiting firm losses, but it attained parity with these mechanisms when audit costs were deleted. This contrast between the results for misrepresentation and firm loss suggests that even though subordinates had engaged in different frequencies, directions and sizes of misrepresentations across control mechanisms, many of these misrepresentations either had been too small, or had offset each other across projects and managers, such that departure from firm-optimal project selections had been averted. This inference is supported by comparing the proportions of truthful communications and optimal project selections. Even though only 13.8 per cent of the p-ratios were truthfully communicated under LPS in steady state (Table 3), optimal project selections were made in 49 out of 142 cases (34.5 per cent). Similarly, all of the other control mechanisms had higher proportions of optimal project selections than truthfully communicated p-ratios: G: 63.5% versus 32.2%; OR: 48.4% versus 26.9%; and NMS: 51.1% versus 39.3%.

SUMMARY AND DISCUSSION

The findings from a laboratory experiment indicated that relative to the commonly observed linear profit sharing pay scheme, two analytically derived incentive schemes were more effective at reducing the frequency and magnitude of misrepresentations by subordinates, as well as the firm losses (profit forgone) from suboptimal resource allocations induced by these misrepresentations. However, non-mechanistic superiors who used selective, costly and imperfect audits, together with subjective judgment and prior period experience, were even more effective than the analytically derived schemes at suppressing both the frequency and magnitude of subordinate misrepresentations. However, this superior performance did not translate into significantly lower levels of firm losses, largely due to costs of auditing.

The finding that a pragmatic proxy for practice can match or surpass the truth-inducing properties of analytically derived mechanisms offers a possible explanation for the non-adoption of the latter. However, none of the control mechanisms tested—whether from theory or practice—was able to eliminate subordinate misrepresentations or the firm losses that they caused. Given that all of the schemes tested in this study leave room for improvement, future progress could be made by testing ways to incorporate the most effective features of both analytic schemes and controls found in practice.

In Waller's (1994) review and critique of management accounting experiments on employment contracts, the call was made for accounting experimenters to 'creatively go beyond the limits of formal modeling'. It was noted (pp. 722–3) that 'by systematically introducing experimental treatments that represent behavioural as well as economic conditions, experimenters may discover empirical patterns that supplement the insights derivable from analytical methods'. Consistent with this call, the current study has incorporated features including new variants of audits and human discretion. Still, the findings constitute only a small step towards a better understanding of the factors affecting subordinate communications. Much progress can yet be made by further expanding this direction of investigation. Below, six possibilities for extending and refining the current study are discussed.

First, this study has assumed that other than the audits performed by the non-mechanistic superior, none of the control mechanisms had implementation costs. This approach undoubtedly has placed the NMS mechanism at a disadvantage, especially relating to firm losses. On the other hand, the way that management audits were operationalized probably captured only a small subset of their effects (cf n. 8). A systematic investigation of the nature of alternate control mechanisms' implementation processes and costs would improve the external validity of the findings.

Second, this study has assumed that each subordinate has perfect private information. A more realistic assumption is that information is subject to uncertainty, in turn affecting the degree and nature of the information asymmetry faced by superiors *vis-à-vis* subordinates.

Third, this study has considered only the truthfulness of subordinates' communications. Real world organizations also are concerned with other aspects of employee actions and behaviours, including job effort, and the time horizon and riskiness of decisions. More research is needed to understand the effects of controls in such a multi-objective environment.

Fourth, and related, the information communicated by subordinates and measures of their performance are used for more than determining resource allocations and short-term bonus pay. An example of other uses is ranking subordinates for selection or promotions (Baker *et al.*, 1988). Thus, subordinates are likely to also consider how their communications affect their standing relative to peers. Extending the investigation to such other uses of performance evaluations can further increase the external validity of the findings.

Fifth, there is accumulating evidence that people from different national backgrounds can have different preferences for and reactions to controls (Chow *et al.*, 1994b, 1996, 1999; Hofstede, 1991; Merchant *et al.*, 1995; Schwartz, 1994). To the extent that work-related cultures differ across nations, both the nature of management issues (e.g., the degree to which subordinates would seek to benefit at the expense of the firm or superior) and the most effective responses to them also may vary among nations. In the increasingly globalized economic environment of today, much potential benefit exists from expanding the investigation to beyond the boundaries of a single nation.

Finally, while this study's use of a laboratory experiment has such advantages as control, internal validity and replicability, this empirical method also has weaknesses. One is the limited degree to which treatments can capture the range and essence of real world practices, as in the case of management audits under NMS. Also, experiments have limited ability to include some important attributes of employment settings, such as organizational culture. In addition, there always is the possibility that the findings are an artefact of the specific operationalization of variables and the parameter values used. While other methods, such as surveys, archival analysis and case/field studies, also have weaknesses, a multi-methods approach can produce, in the aggregate, results that are more informative as well as more reliable (Birnberg *et al.*, 1990).

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Technical Efficiency and Technological Change in Australian Building Societies

In this study, the nature and extent of efficiency and productivity growth in deposit-taking institutions is investigated using nonparametric frontier techniques. Employing Malmquist indices, productivity growth is decomposed into technical efficiency change and technological change for a sample of Australian building societies. The results indicate that most building societies experienced productivity gain in the past several years, and this was largely the result of technological progress rather than efficiency improvements. That productivity growth which did occur due to an increase in efficiency over the period tended to be the result of improvements in scale efficiency, while efficiency gain was most pronounced in building societies with a high ratio of net interest income and non-interest income to total assets, low operating expense ratios, and relatively high expenditures on marketing and promotion.

Key words: Building societies; Efficiency; Financial institutions; Productivity; Technological change.

For most of their history, building societies have operated within a well-defined, institution-specific, regulatory sub-sector of the Australian financial system. However, in the period following the major Australian Financial System (Campbell) Inquiry (1981) recommendations, building societies, along with other financial service providers, were forced to adapt to a newly deregulated environment. In its 1997 *Stocktake of Financial Deregulation*, the Financial System (Wallis) Inquiry (1997, p. 640) summarized the effect of these reforms as follows:

> Efficiency has improved in several areas since deregulation. Increased pricing efficiency in securities and foreign exchange markets in particular, has improved resource allocation. The productivity of finance sector participants has risen in many cases, as has their dynamic efficiency, with technological innovations playing a major role in these improvements... [however] there are equal grounds for concluding that deregulation has been neither complete, nor completely effective, in all respects.

Unfortunately, this summary says little about the pattern of efficiency, technological and productivity change in pre-deregulatory sub-sectors, including building societies. For example, while falling operating expense ratios were used as a pointer by the

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Wallis Inquiry to likely post-deregulatory increases in technical efficiency for banks, there is less elaboration on the fact that these ratios increased for building societies over the same period. Likewise, the impact of heightened competition in the home lending market, as amplified by falling barriers to entry facilitated by technological innovation, has had a disproportionate influence on some financial institution sub-sectors. For instance, over the last decade, building societies' share of home lending commitments (by number) have fallen from 15.7 per cent to some 4.3 per cent. Little is known about the relative impact of these technological changes on financial institution productivity.

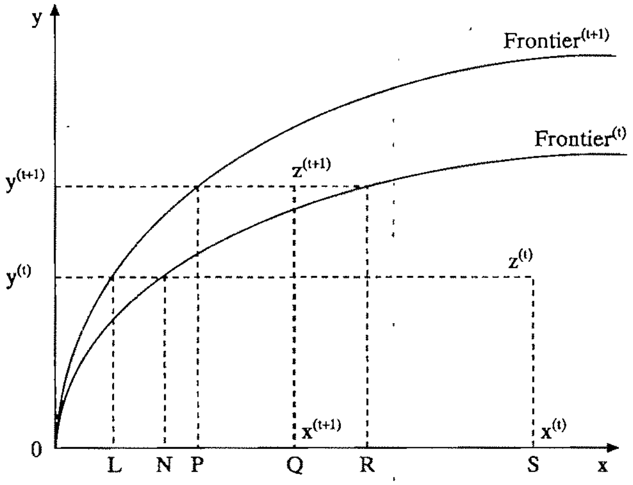
A careful analysis of financial sector productivity at the institution-specific level should therefore add to our knowledge about the factors determining the pattern of efficiency gain and technological progress in Australia. In addition, such an analysis should provide useful information for two major elements of the Wallis proposals; namely, prudential supervision for all banks, credit unions, building societies, insurance companies and superannuation funds by the Australian Prudential Regulation Authority (APRA), and consumer protection and supervision by the Corporations and Financial Services Commission (CFSC). For example, there are still-unanswered questions relating to the provision of specialized liquidity facilities, the establishment of differential regulatory régimes, and the implicit guarantees thought to exist between state governments and state-based financial institutions (like building societies and credit unions) under the Wallis proposals (Edwards and Valentine, 1998). There is an obvious requirement for empirical studies to provide measures of efficiency changes and technological progress so as to help address these uncertainties.

MALMQUIST INDEXES OF PRODUCTIVITY AND TECHNICAL CHANGE

Traditionally, economists have employed *production possibility frontiers* in their attempts to measure technical efficiency, technological progress and productivity growth in organizations and industries. Production possibility frontiers map a locus of potentially technically efficient input–output combinations an organization is capable of producing at any point in time using the available technology. *Technical efficiency* here refers to the ability to use a minimal amount of input to make a given level of output. To the extent an organization fails to achieve an output combination on its production possibility frontier, and falls beneath this frontier, it can be said to be technically inefficient. Over time, however, the level of output an organization is capable of producing will increase due to *technological changes* that affect the ability to optimally combine inputs and outputs. These technological changes cause the production possibility frontier to shift upward, as more outputs are obtainable from the same level of inputs. Thus for any organization in an industry, *productivity improvements* over time (that is, more outputs for the same or lower level of inputs) may be either technical efficiency improvements (catching up with their own frontier) or technological improvements (because the frontier is shifting up over time), or both. Accordingly, if we can determine production frontiers that represent the best currently known production techniques, then we can use

FIGURE 1

PRODUCTIVITY CHANGES OVER TIME



this idealized yardstick to evaluate the performance of actual organizations and industries. Identifying changes in this frontier over time will then allow the decomposition of overall productivity growth into technical efficiency gains and technological improvements.

The framework employed in the current study can be illustrated by Figure 1 following Färe *et al.* (1990; 1993), Hjalmarsson and Veiderpass (1992), Berg *et al.* (1992), and Price and Weyman-Jones (1996). In this diagram, a production frontier representing the efficient level of output (y) that can be produced from a given level of input (x) is constructed, and the assumption made that this frontier can shift over time. The frontiers thus obtained in the current (t) and future (t + 1) time periods are labelled accordingly. When inefficiency is assumed to exist, the relative movement of any given financial institution over time will therefore depend on both its position relative to the corresponding frontier (technical efficiency) and the position of the frontier itself (technical change). If inefficiency is ignored, then productivity growth over time will be unable to distinguish between improvements that derive from a financial institution 'catching up' to its own frontier, or those that result from the frontier itself shifting up over time.

Now for any given building society in period t, say, represented by the input/output bundle z(t), an input-based measure of efficiency can be deduced by the horizontal distance ratio 0N/0S. That is, the inputs that can be reduced in order to make production technically efficient in period t (i.e., movement onto the efficient frontier). By comparison, in period t + 1 inputs should be multiplied by the horizontal distance ratio 0R/0Q in order to achieve comparable technical efficiency to that found in period t. Since the frontier has shifted, 0R/0Q exceeds unity, even though it is technically inefficient when compared to the period t + 1 frontier.

It is possible using the Malmquist input-orientated productivity index to decompose this total productivity change between the two periods into technical change and technical efficiency change. Input-orientation refers to the emphasis on the equiproportionate reduction of inputs, within the context of a given level of output. Berg *et al.* (1992) also used an input-orientated approach to analyse the effects of deregulation in Norwegian financial services, and Fukuyama (1995) has employed an identical specification to measure efficiency and productivity in Japanese banking. Following Färe *et al.* (1994), the input-based Malmquist productivity change index may be formulated as:

$$M_I^{t+1}(y^{t+1}, x^{t+1}, y^t, x^t) = \left[\frac{D_I^t(y^{t+1}, x^{t+1})}{D_I^t(y^t, x^t)} \times \frac{D_I^{1+t}(y^{t+1}, x^{t+1})}{D_I^{1+t}(y^t, x^t)}\right]^{1/2} \tag{1}$$

where the subscript I indicates an input-orientation,

M is the productivity of the most recent production point (x^{t+1}, y^{t+1}) (using period t + 1 technology) relative to the earlier production point (x^t, y^t) (using period t technology),

D are input distance functions, and all other variables are as previously defined.

A value greater than unity will indicate positive total factor productivity growth between the two periods. Following Färe *et al.* (1993), an equivalent way of writing this index is:

$$M_I^{t+1}(y^{t+1}, x^{t+1}, y^t, x^t) = \frac{D_I^{t+1}(y^{t+1}, x^{t+1})}{D_I^t(y^t, x^t)}\left[\frac{D_I^t(y^{t+1}, x^{t+1})}{D_I^{t+1}(y^{t+1}, x^{t+1})} \times \frac{D_I^t(y^t, x^t)}{D_I^{t+1}(y^t, x^t)}\right]^{1/2} \tag{2}$$

or

$$M = E \cdot P \tag{3}$$

where

$$E = \frac{D_I^{t+1}(y^{t+1}, x^{t+1})}{D_I^t(y^t, x^t)}$$

$$P = \left[\frac{D_I^t(y^{t+1}, x^{t+1})}{D_I^{t+1}(y^{t+1}, x^{t+1})} \times \frac{D_I^t(y^t, x^t)}{D_I^{t+t}(y^t, x^t)}\right]^{1/2} \tag{4}$$

where M (the Malmquist total factor productivity index) is the product of a measure of technical progress P (the two ratios in the square bracket) as measured by shifts in the frontier measured at period t + 1 and period t (averaged geometrically) and a change in efficiency E over the same period (the term outside the square bracket).

In order to calculate these indices it is necessary to solve several sets of linear programming problems. We assume that there are N building societies and that each consumes varying amounts of K different inputs to produce M different outputs. For the ith building society these are represented by the vectors x_i and y_i, respectively. The (K × N) input matrix, X, and the (M × N) output matrix, Y, represents the data of all N building societies in the sample. The purpose is to construct a non-parametric envelopment frontier over the data points such that all observed points lie on or below the production frontier. The calculations exploit the fact that the input distance functions (D) used to construct the Malmquist index are the reciprocals of Farrell's (1957) input-orientated technical efficiency measures. They therefore bear a close resemblance to the Charnes *et al.* (1978) data envelopment analysis (DEA) model.

In parenthesis for interested readers, DEA is a linear programming-based methodology designed to measure the efficiency of 'decision making units' or DMUs. Typically, each of the DMUs in a given population uses the same multiple inputs in varying quantities to produce varying quantities of the same multiple outputs. Using the actual observed values for the inputs and outputs for each DMU, DEA constructs a piecewise extremal production surface, which in economic terms represents the revealed best practice production frontier—the maximum output empirically obtainable for any DMU in the observed population, given its level of inputs. For each DMU that lies below the frontier, the level of efficiency is determined by comparing these ***inefficient*** DMUs to either a single referent DMU or a convex combination of other referent DMUs located to the ***efficient*** frontier. Efficient DMUs typically utilize the same level of inputs and produce the same level or higher of outputs. This is accomplished by requiring solutions to satisfy inequality constraints that can increase some outputs or decrease some inputs without worsening other inputs and outputs. Thus, the DEA measure of efficiency is ***relative*** in that it is calculated in relation to all other DMUs in the sample, as against the ***absolute*** measures of efficiency obtained when a production function is specified in, say, the econometric approach to efficiency measurement.

The first two linear programs (equations (5) and (6)) are where the technology and the observation to be evaluated are from the same period, and the solution value is less than or equal to unity. The second two linear programs (equations (7) and (8)) occur where the reference technology is constructed from data in one period, whereas the observation to be evaluated is from another period. Assuming constant returns-to-scale to start with (where any scaled-up or scaled-down versions of the input combinations are also included in the production possibility set), the following input-orientated linear programs are used:

$$\begin{aligned} [D_I^t(y_t, x_t)]^{-1} &= \min_{\theta,\lambda} \theta \\ \text{s.t.} - y_{it} + Y_t\lambda &\geq 0 \\ \theta x_{lt} - X_t\lambda &\geq 0 \\ \lambda &\geq 0 \end{aligned} \tag{5}$$

$$\begin{aligned} [D_I^{t+1}(y_{t+1}, x_{t+1})]^{-1} &= \min_{\theta,\lambda} \theta \\ \text{s.t.} - y_{i,t+1} + Y_{t+1}\lambda &\geq 0 \\ \theta x_{i,t+1} - X_{t+1}\lambda &\geq 0 \\ \lambda &\geq 0 \end{aligned} \tag{6}$$

$$\begin{aligned}[D_I^{t+1}(y_t, x_t)]^{-1} &= \min_{\theta,\lambda} \theta \\ \text{s.t.} -y_{it} + Y_{t+1}\lambda &\geq 0 \\ \theta x_{it} - X_{t+1}\lambda &\geq 0 \\ \lambda &\geq 0\end{aligned} \tag{7}$$

$$\begin{aligned}[D_I^{t}(y_{t+1}, x_{t+1})]^{-1} &= \min_{\theta,\lambda} \theta \\ \text{s.t.} -y_{i,t+1} + Y_t\lambda &\geq 0 \\ \theta x_{i,t+1} - X_t\lambda &\geq 0 \\ \lambda &\geq 0\end{aligned} \tag{8}$$

where θ is a scalar and λ is an $N \times 1$ vector of constants.

The value of θ will be the efficiency score for the ith building society. In (5) and (6) each building society's production points are compared with technologies from the same time period. In (7) and (8) they are compared to technologies from different time periods. Decomposing the constant returns-to-scale technical efficiency change into scale efficiency and pure technical efficiency components further extends this approach. This is useful in that the constant returns-to-scale specification is only appropriate where all building societies are operating at the optimal scale (which is unlikely where capital requirements and other regulatory constraints exist). Where this is not the case, the measures of technical efficiency obtained by the constant return-to-scale form will be confounded by the presence of scale efficiencies. The procedure itself involves calculating additional linear programs where the convexity constraint $N1'\lambda = 1$ is introduced to programs (5) to (8), where $N1'$ is a transposed $(N \times 1)$ vector of ones. Once again, it is obvious that the input distance function (D) as calculated here is the reciprocal of an input-orientated Farrell measure of technical efficiency calculated relative to technology satisfying variable returns-to-scale *vis-à-vis* Banker *et al.* (1984). By running these programs with the same data under constant returns-to-scale (without convexity constraint) and variable returns-to-scale (with convexity constraint) assumptions, measures of overall technical efficiency (E) and 'pure' technical efficiency (PT) are obtained. Dividing overall technical efficiency (E) by pure technical efficiency then yields a measure of scale efficiency (S).

Using these models, and the Färe *et al.* (1994) approach, it is thus possible to provide four efficiency/productivity indices for each firm and a measure of technical progress over time. These are: (a) technical efficiency change (E) (i.e., relative to a constant returns-to-scale technology); (b) technological change (P); (c) pure technical efficiency change (PT) (i.e., relative to a variable returns-to-scale technology); (d) scale efficiency change (S); and (e) total factor productivity (M) change. Recalling that M indicates the degree of productivity change, then if $M > 1$ then productivity gains occur, while if $M < 1$ productivity losses occur. Regarding changes in efficiency, technical efficiency increases (decreases) if and only if E is greater (less) than one. An interpretation of the technological change index is that technical progress (regress) has occurred if P is greater (less) than one.

An assessment can also be made of the major sources of productivity gains/losses by comparing the values of E and P. If E > P then productivity gains are largely the result of improvements in efficiency, whereas if E < P productivity gains are primarily the result of technological progress. An indication of the major source of efficiency change can be obtained by recalling that overall technical efficiency is the product of pure technical efficiency and scale efficiency, such that E = PT × S. If PT > S then the major source of efficiency change (both increase and decrease) is improvement in pure technical efficiency, whereas if PT < S the major source of efficiency is an improvement in scale efficiency. Further details on the interpretation of these indices may be found in Charnes *et al.* (1993). The Malmquist DEA method described is constructed using DEAP Version 2.1.

An important task that arises after the calculation of the Malmquist productivity indices is to attribute variations in productivity, efficiency and technological change to specific characteristics of building societies. The technique selected for explaining variation is a regression-based approach. The general form is:

$$m^*_{it} = z'_{it}\beta + e_{it} \quad i = 1, \ldots, N. \quad \text{and} \quad t = 1, \ldots, T. \tag{9}$$

where m^*_{it} is an index measure of either technical efficiency (E), technological (P) or total factor productivity (M) change,
z'_{it} is a set of explanatory variables posited to explain productivity in financial institutions,
β is a vector of parameters to be estimated,
and $e_{it} \sim N(0, \sigma^2)$.

In this approach, the productivity of the building society is related to a set of financial measures that characterise its operation. Past approaches that have employed nonparametric techniques to measure financial institution efficiency followed by parametric techniques to assign variation in efficiency include Mester (1993), Cebenoyan *et al.* (1993), Fried *et al.* (1993), Fried *et al.* (1996), Miller and Noulas (1996), Berger and Mester (1997) and Worthington (1998b). SHAZAM Version 8.0 is used for the second-stage regression analysis.

SPECIFICATION OF INPUTS/OUTPUTS AND EXPLANATORY VARIABLES

The data used in this study consist of annual observations of a sample of fifteen Australian building societies. All data are sourced from the Australian Financial Institutions Commission (AFIC). (On 1 July 1999 APRA became responsible for the prudential regulation of building societies.) The time period selected is 1993/4 to 1996/7. The GDP implicit deflator is used to deflate the monetary variables from 1994/5, 1995/6 and 1996/7 to 1993/4 prices. A more extensive set of time-series data would, of course, be more valuable. For example, much regulatory reform and product innovation occurred during the late 1980s. Unfortunately, a national framework for prudential supervision of state-based non-bank deposit-taking institutions (along with the requisite database) was only established with the creation of AFIC in July 1992.

TABLE 1

INPUTS, OUTPUTS AND FINANCIAL CHARACTERISTICS, 1993–7

	Variable	Mean	*SD*
Inputs			
x_1	Members' capital (share capital, general reserves and retained profits)	27,388.15	37,293.01
x_2	Physical capital (land, buildings, plant and equipment)	9,215.24	10,469.62
x_3	Full-time equivalent staff	147.96	145.98
x_4	Number of branches (including head office)	20.72	16.49
Outputs			
y_1	Call deposits	179,458.25	211,696.30
y_2	Term deposits	214,714.57	168,191.24
y_3	Personal loans	11.651.76	17,259.97
y_4	Residential loans	331,563.37	312,684.90
y_5	Commercial loans	17,073.81	30,044.61
y_6	Securities (including bank bills and bank deposits)	74,727.99	60,288.48
Profitability			
z_1	Net interest income/total assets	0.0362	0.0069
z_2	Non-interest income/total assets	0.0050	0.0072
Efficiency			
z_3	Operating expenses/total assets	0.0228	0.0111
z_4	Operating expenses/operating income	0.5522	0.2141
Credit quality			
z_5	Doubtful debts expenses/total receivables	0.0011	0.0048
Operations			
z_6	Marketing and promotional expenses/total expenses	0.1666	0.3101
z_7	Information technology expenses/total expenses	0.1035	0.0817

The inputs and outputs employed follow a production-type approach to modelling financial institution behaviour, that is, building societies combine capital (both membership-based and physical), labour and branches to produce deposits, loans and investments. Table 1 provides selected descriptive statistics over the period in question. In terms of specific studies, the approach is most consistent with that used by Berg *et al.* (1993), Favero and Papi (1995) and Fried *et al.* (1996). This 'production' approach views financial institutions as producers of deposit accounts and loans; defining output as the number or dollar value of such accounts or their associated transactions. Inputs in this case are calculated as the number of employees, and capital expenditures on fixed assets and other material. This differs somewhat from the intermediation approach which conceptualizes financial institutions as intermediators: converting and transferring financial assets from surplus units to deficit units. In that instance, the institution inputs are labour and capital costs, and the interest payable on deposits, with the outputs denominated in loans and financial investments.

Starting with the inputs, members' funds (x_1) are measured by summing permanent share capital, share premium accounts, general and other reserves plus outside equity interests, while physical capital (x_2) is measured by equipment, fixtures and premises, either purchased directly or via capitalised leases (Berger and Humphrey, 1991). Labour (x_3) is measured by the number of full-time equivalent employees. Finally, recognizing that branches form an important input into the building society intermediation process, the number of full-branch equivalent operations (x_4) is also included.

In terms of outputs, six categories are employed. These are: call deposits (y_1), term deposits (y_2), personal loans (y_3), residential loans (y_4), commercial loans (y_5), and other financial investments (y_6). The last measure includes current and term bank deposits, deposits with other financial institutions and governmental authorities, and securitized assets, such as bank bills. Specifying financial institution outputs in this manner follows the work of Rangan *et al.* (1988), Ferrier and Lovell (1990), Grabowski *et al.* (1993) and Elyasiani *et al.* (1994). The exact conceptualization of financial outputs relies heavily on one's *a priori* reasoning. Berger and Humphrey (1991), for example, proposed three ways in which financial outputs could be defined: an asset approach (outputs are loans and other assets); a user cost approach (outputs contribute to net revenue); and a value-added approach (outputs contribute to value added). All other things being equal, and in the current context, it is argued that a building society increasing the level of deposits and loans will increase its net production of value-added. Using the approach selected, a relatively efficient building society *ceteris paribus* will therefore minimize the level of capital, the number of branches and staff employed, while maximizing customer outputs in the form of deposit and loan facilities and other investments.

Of course, a large number of additional factors are thought to have an impact on productivity in financial services. For example, Rangan *et al.* (1988) included an index of product diversity in their DEA study of U.S. commercial banks, and Ferrier and Lovell (1990) incorporated the average size of loans and deposits accounts across a range of U.S. deposit-taking institutions (DTIs). Alternatively, Cebenoyan *et al.* (1993) attempted to proxy the competitive environment in U.S. savings and loans (S&Ls) by including the industry concentration ratio and the market share held by individual firms, Shaffer (1993) included the proportion of off-balance sheet assets, and Mester (1987) and Drake and Weyman-Jones (1996) used liquid asset holdings in excess of capital requirements. The latter studies in particular highlight the fact that there may be a degree of conflict between strictly efficient performance and compliance with capital adequacy requirements and other regulations. Unfortunately, there is no data set available reflecting all factors relevant to calculating building society efficiency at the present time.

The explanatory variables to be included in the second-stage regression are also presented in Table 1. The first group of variables are intended to account for the relationship between building society profitability and productivity (including both technical efficiency and technological change). These are: (a) the ratio of net interest income (interest income less interest expense) to total assets (z_1); and (b) the ratio of non-interest income (revenue less interest income and bad debt recoveries) to total assets (z_2) (Shaffer, 1993; Worthington, 1998c). These aspects of building society financial management are closely linked with each organization's theoretical ability to efficiently allocate resources. For example, the ratio of non-interest income is considered especially important since one aspect of the post-deregulation marketplace has been the emphasis on pricing services in order to provide incentives for efficiency improvements. It is argued *ceteris paribus* that a more profitable building society will be associated with greater productivity gains over the period due to the positive influence of these factors on the ability to operate efficiently. Positive coefficients are therefore hypothesized when productivity is regressed against measures of profitability (or financial management ability).

The second group of variables are traditional measures of financial institution efficiency. It is posited that a building society with a low ratio of operating expenses (total expenses before tax and bad debts less interest and doubtful debts expense) to total assets (z_3) and a low ratio of operating expense to operating income (net interest plus non-interest income) (z_4) should be relatively more productive due to a higher level of technical efficiency (see, e.g., Fried *et al.*, 1993, and Worthington, 1998a). Negative coefficients are hypothesized.

The third group of variables is comprised of total provisions for doubtful debts divided by gross receivable (loans and advances) (z_5) and is therefore a measure of credit quality (Mester, 1993). It is argued that a building society with a relatively higher level of credit quality will have achieved greater productivity gains over the period. This will have indicated its ability to weather the strong post-deregulation competitive forces in loan markets at the same time as minimizing the side effects of delinquent loans. The emphasis here is on efficiency gains: building societies with an appropriately managed loan portfolio will be able to minimize inputs for any given level of loan output. The final group of variables detailed in Table 1 relate to two areas of expenditure that have grown markedly in the period since deregulation; marketing and promotional expenses (z_6) and information technology expenses (z_7) (both as a percentage of total expenses). It is posited that the adoption of technological innovation and technically efficient behaviour may have been more rapid in those building societies devoting a relatively higher proportion of expenditures to these areas. Finally, a time index (z_8) is included to measure the movement of productivity change over the overall period in question. No sign is postulated *a priori* on the coefficient for the time index.

RESULTS

The previous section defined Malmquist indices of productivity growth relative to a reference technology for the period 1993/4 to 1996/7. Using this information, three primary issues are addressed in our computation of Malmquist indices of productivity growth. The first is the measurement of productivity change over the period. The second is to decompose changes in productivity into what are generally

TABLE 2

MALMQUIST INDEX SUMMARY OF FIRM MEANS, 1993–7

Firm	Efficiency change	Technical change	Pure technical efficiency	Scale efficiency	Total factor productivity change
1	1.000	1.216	1.000	1.000	1.216
2	0.936	0.946	0.942	0.994	0.885
3	1.001	1.006	0.996	1.005	1.007
4	1.000	0.679	1.000	1.000	0.679
5	1.000	1.207	1.000	1.000	1.207
6	1.061	1.094	1.000	1.061	1.160
7	1.000	0.992	1.000	1.000	0.992
8	1.000	1.065	1.000	1.000	1.065
9	1.000	1.256	1.000	1.000	1.256
10	0.959	1.111	0.974	0.984	1.065
11	1.000	0.910	1.000	1.000	0.910
12	1.000	1.241	1.000	1.000	1.241
13	1.000	1.161	1.000	1.000	1.161
14	1.000	1.067	1.000	1.000	1.067
15	1.000	1.011	1.000	1.000	1.011

referred to as a ‘catching-up’ effect (efficiency change) and a ‘frontier shift’ effect (technological change). In turn, the ‘catching-up’ effect is further decomposed to identify the main source of improvement, through either enhancements in technical efficiency or increases in scale efficiency. Finally, there is a test for whether differences in the various indices for different sizes of building societies and differences in the indices for each of the included years have statistical significance. This usually requires the use of nonparametric statistical methods.

First there is an examination of the changes in productivity, efficiency and technology for financial services in the period 1993/4 to 1996/7. Inputs were specified in terms of members funds, physical capital, and the number of staff and branches, and outputs in terms of the dollar value of loans and deposits across six categories. In Table 2 descriptive statistics of the indices of productivity growth (M), efficiency change (E), and technological change (P) for each building society are detailed. Wilcoxon (one-sample) signed-ranks tests are used to test the significance of the efficiency, technology and productivity index measures over the pooled institutions and years. This is necessary since at least part of the following analysis assumes that these measures differ from unity. The test statistics indicate that all three measures are asymptotically significant at the .01 level or better.

For each building society in the sample, the total factor productivity change is the product of efficiency and technical change. Index measures greater (less) than unity indicate that there has been productivity gain (loss), efficiency increase (decrease) or technical progress (regress). Similarly, the overall efficiency change is the product of pure technical efficiency and scale efficiency change. For example, in

Table 3

MALMQUIST INDEX SUMMARY OF ANNUAL MEANS, 1993/4–1996/7

Year	Efficiency change	Technical change	Pure technical efficiency	Scale efficiency	Total factor productivity change
1993/4	0.9820	1.0920	0.9790	1.0030	1.0720
1994/5	0.9930	1.0240	1.0070	0.9860	1.0170
1995/6	1.0270	1.0170	1.0000	1.0270	1.0450
1996/7	0.9850	1.0800	0.9890	0.9960	1.0640
Mean	0.9970	1.0530	0.9940	1.0030	1.0490

building society number six there was an average positive increase in total factor productivity over the period in question of 16 per cent (1.160–1.000). This was composed of a 6.1 per cent efficiency gain (1.061–1.000) and a 9.4 per cent increase (1.094–1.000) due to technological progress. As discussed earlier, the efficiency change can be decomposed into its pure technical efficiency and scale efficiency portions. In this building society there has been no change in pure technical efficiency (1.000–1.000) so the efficiency change is solely the product of scale efficiency improvements (1.061–1.000). These results contrast with building society number fifteen where the 11 per cent increase in productivity was composed entirely of technical progress.

Table 3 presents the means for each of the sample years. The Malmquist index averages over the entire period (bottom row) are geometric means of the indices computed for each of the sample years. However, whereas the annual indices for efficiency, technical and productivity changes are significantly different from unity across the pooled sample, in individual years they are sometimes insignificant. For instance, in 1995 the Wilcoxon (one-sample) signed-ranks test indicates that none of the index measures is significantly different from unity. In 1996, the efficiency and productivity changes are asymptotically significant at the .10 level and technical change is insignificant, and in 1997 productivity change and technical change are significant at the .05 level but efficiency change is insignificant.

As indicated in Table 3, there was a mean annual increase in total factor productivity of 4.9 per cent (1.049–1.000) over the period ending 30 June 1997. Given that the Malmquist index of productivity change (M) is a multiplicative composite of efficiency (E) and technological change (P), the major cause of productivity improvements can be ascertained by comparing the values of the efficiency change and technological change indexes. Put differently, the productivity improvements described can be the result of efficiency gains, technological progress, or both. In the case of Australian building societies, the overall improvement in productivity over the period is composed of an average efficiency decrease (movement away from the frontier) of 0.30 per cent, and an average technological progress (upward shift of the frontier) of 5.3 per cent. However, these figures serve to obscure some variation in productivity for each of the years in the sample. For example, annual total factor productivity gains range from 1.7 per cent in 1995 to 7.2 per cent in 1994, and efficiency changes range from a loss of 1.8 per cent in 1994 to a gain of 2.7 per cent in 1996. The results generally support the findings of the Wallis Inquiry that building society technical efficiency fell in the period to June 1997.

Using Mann-Whitney and Kolmogorov-Smirnov nonparametric tests, an effort is made to determine whether the frontier shift and catching-up effects differ statistically across building societies and years. The null hypothesis in the first instance is that the indices are equivalent in location, while in the second the null hypothesis is that the groups are equivalent in the shape and location of the efficiency distribution. While there are no precedents in financial services for testing changes in Malmquist indices on this basis, several comparable studies in other industries have employed these techniques. For example, Price and Weyman-Jones (1996) have used nonparametric Kolmogorov-Smirnov tests for the purposes of analysing Malmquist indices in the privatized U.K. gas industry, and Fukuyama (1995) used Spearman's rank correlation for measuring efficiency and productivity growth in Japanese banking. The test for efficiency change cross time using the Mann-Whitney test statistic rejected the null hypothesis of equal means in technological progress for 1993/4 (MW = 111.98) and for total factor productivity in 1995/1996 (MW = 99.25). Differing results are obtained for the Kolmogorov-Smirnov tests where the efficiency differences between 1994/5 and 1995/6 are found to be asymptotically significant at the .01 and 0.10 levels respectively (KS = .365 and .548 respectively). This would suggest that there are statistically significant differences in the frontier shift effects and efficiency changes for each of the years in the sample.

To further investigate variation in productivity, the building societies are grouped into asset size quartiles and compared on the basis of Kolmogorov-Smirnov nonparametric test statistics. It is found that building societies in the highest quartile have larger efficiency and productivity gains that either the second or third quartiles. Put differently, efficiency and productivity gains were higher in the largest 25 per cent of building societies than in the middle 50 per cent of building societies by asset size over the sample period. In addition, building societies in the second quartile differ from those in the bottom two quartiles (the smallest 50 per cent of building societies) in having larger frontier shift effects and efficiency gains. These results generally show that productivity improvements and efficiency gains vary across the sample. However, the main source of productivity improvement in all building societies, irrespective of asset size, was technological progress rather than efficiency gains.

The second part of the analysis of building society productivity is a regression-based approach. Table 4 presents the results of a pooled time-series, cross-sectional regression with a set of assumptions that give a cross-sectionally correlated and time-wise autoregressive model. The dependent variables are the efficiency (E), technological progress (P) and total factor productivity (M) indices for each year of the sample compared to the previous year (the time-series therefore starts with 1994/5 since no indices are computed for the first year of the sample). The explanatory variables are the ratios of net interest income (z_1) and non-interest income (z_2) to total assets, the ratio of operating expenses to total assets (z_3) and operating

TABLE 4

DETERMINANTS OF PRODUCTIVITY VARIATION, 1994/5–1996/7

	Total factor productivity			Efficiency gain			Technological progress		
Variable	Coefficient	Std error	Elasticity	Coefficient	Std error	Elasticity	Coefficient	Std error	Elasticity
z_1	$^{(0.01)}$18.4170	3.7200	0.5952	$^{(0.01)}$21.7330	0.8915	0.7671	$^{(0.01)}$18.6960	3.5290	0.6059
z_2	$^{(0.01)}$36.0800	11.6600	0.1817	$^{(0.01)}$19.1970	3.1930	0.1056	$^{(0.01)}$34.6580	10.4000	0.1750
z_3	$^{(0.01)}$–49.4190	13.1500	−0.9464	$^{(0.01)}$–33.6260	3.7120	−0.7033	$^{(0.01)}$–47.9710	11.3200	−0.9213
z_4	$^{(0.01)}$–2.3786	0.3877	−1.1020	$^{(0.01)}$–1.4521	0.1163	−0.7347	$^{(0.01)}$–2.2651	0.3514	−1.0524
z_5	24.1990	52.2400	0.0074	−4.7291	13.4300	−0.0016	13.9320	46.4300	0.0043
z_6	0.1055	0.3235	0.0136	$^{(0.01)}$0.3035	0.1073	0.0429	0.0829	0.2973	0.0108
z_7	−0.0556	0.4535	−0.0053	−0.1426	0.1114	−0.0149	0.0724	0.4336	0.0070
z_8	0.0139	0.0191	0.0319	$^{(0.01)}$0.0275	0.0061	0.0688	0.0160	0.0191	0.0368

Note: Figures in brackets indicate level of significance; elasticities calculated at the means; dependent variables are: M—total factor productivity, E—Efficiency gain, and P—technological progress; log-likelihoods 4.60, 79.07 and 9.56 respectively, Buse Raw-Moment R-Square 0.9852, 0.9981 and 0.9838 respectively.

income (z_4), provision for doubtful debts divided by gross receivables (z_5), the proportion of total expenses made on marketing and promotion (z_6) and information technology (z_7), and a time index (z_8).

The first three columns of Table 4 are the estimated coefficients, standard errors and elasticities (at the means) for the regression of the total factor productivity indices (M) on the vector of explanatory variables. A test of the null hypothesis that all the slope coefficients are jointly zero is rejected at the .01 level using a Wald χ^2 statistic, as are joint tests for the significance of the profitability and efficiency measures. The Buse raw-moment R^2, detailed in Table 4 are obviously high, though these should be interpreted with the usual caution, especially when considering the inclusion of time-series data in the sample. As indicated, productivity gain over the sample period is higher for building societies with higher profitability and lower operating expense ratios. The marginal effect of these variables on productivity is highest for the ratio of operating expense to operating income (–1.1020) followed by the ratio of operating expense to total assets (–0.9464). Of course, there are any number of additional variables which may be more appropriate in explaining the productivity of Australian building societies. For example, no allowance has been made for changes in macroeconomic conditions, differences in accounting procedures, or modifications in the competitive structure of financial services. The possible effect of these additional dimensions of firm performance and exogenous shocks on productivity has been ignored in both the input/output calculations and the second-stage regression.

The estimated coefficients of the regressions where technical efficiency (E) and technological progress (P) are specified as the dependent variables are also detailed in Table 4. A test of the null hypothesis of the joint insignificance of the explanatory variables is rejected at the .01 level, and we may conclude that the vector of financial indicators exerts a significant influence on the magnitude of both efficiency change and technological progress. The estimated coefficients and levels of significance are broadly comparable to those found in the earlier discussion. However, unlike the previous analysis, the coefficients on the proportion of marketing expenditure and the time index are positive and significant in the efficiency regression. The latter would suggest that efficiency has steadily improved in relative terms over the sample period.

CONCLUDING REMARKS

Productivity growth in Australian building societies was analysed over the period 1993/4 to 1996/7 within the framework of the DEA piece-wise linear production function and the Malmquist productivity index. This allowed the simultaneous analysis of changes in best practice due to frontier growth and changes in the relative efficiency of building societies owing to movements towards existing frontiers. Overall, the results indicate that there was productivity growth at the frontier during the period in question, and that most of the productivity growth resulted from shifts in the production frontier, rather than gains in technical efficiency by inefficient building societies. This appears to be consistent with the general findings of the Wallis Report on post-deregulation technological developments (this is necessarily qualified since the sample dates only from 1993/4). The results also indicate that a number of variables help explain variation in technical efficiency and technological change in the period since deregulation. The most important factors in determining the overall pattern of productivity appear to be the levels of profitability, efficiency and, in some cases, expenditures on marketing and promotion.

However, a major limitation of the present study relates to the possibility of errors of measurement in inputs and outputs. For example, within a given building society measures of physical capital (as defined) are subject to changes over time in accounting principles, embracing both historical cost and current-cost accounting, and variation in accounting principles between societies. This indicates that the definition of 'best practice' is likely to vary over time and across societies, and that at least some efficiency, technical and productivity change may arise from variation in accounting procedure. Likewise, the imposition of capital requirements by regulatory authorities would also impact upon the theoretical ability of building societies to alter input–output bundles (notwithstanding the variable returns-to-scale specification's allowance for building societies operating at a sub-optimal scale). The focus on extreme observations makes DEA-based methods, such as those employed here, particularly sensitive to variable selection, model specification and measurement errors such as these. However, the Malmquist index itself is entirely general, and could be applied to stochastic efficiency measurement techniques as at least one way of addressing these concerns.

There is any number of ways in which this research could be extended. One possibility is to subject different sub-groups of financial institutions, such as credit unions and banks, to the same approach. This would highlight the relative patterns of productivity gain in these related groups of institutions. Another possibility is to combine a broader classification of deposit-taking institutions, say, banks, building societies and credit unions, within a single analysis. This would serve to provide some idea of the relative efficiency gains of institutions now supervised by APRA. Finally, a longer series of observations on any or all of these deposit-taking institutions would allow the closer investigation of productivity gains, efficiency change, and technological progress in financial services. This would yield more thorough information about the impact of recent microeconomic reform.

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The Impact of Losses and Cash Flows on Dividends: Evidence for Japan

The article's purpose is to examine the impact of cash flows, earnings and losses in setting dividend policy in Japan. More specifically, (a) earnings, cash flows and annual losses are posited to be associated with dividend changes in firms with established earnings and dividend records; and (b) dividend reductions, current operating earnings and cash flows have information content in predicting future earnings. The results here support these hypotheses. Moreover, annual losses are shown to be a necessary but not a sufficient condition for dividend reductions in firms with established earnings and dividend records. About 80 per cent of the 191 Japanese firms that reported losses during the period 1990–4 reduced or omitted dividends. In contrast, only 16 per cent of the 338 firms that did not report losses during the same period reduced dividends.

Key words: Capital markets; Cash flows; Dividends; Earnings; Japan; Losses.

A fundamental question in corporate finance has been whether changes in dividend policy convey information about firm performance to capital markets. Not only are there well-documented price reactions to announcements of changes in dividend policy, but dividends have also been established as a mechanism whereby information related to the operations and future plans of a firm can be communicated (Michaely *et al.*, 1995; Benartzi *et al.*, 1997). As a result, the magnitude of information effects of dividends has increased the need for the prediction of dividend changes. Commencing with Lintner (1956), several other researchers examined the association between earnings and dividend changes. More recent studies have focused on the impact of losses on dividend changes (DeAngelo and DeAngelo, 1990; DeAngelo *et al.*, 1992), as well as on the effect of cash flow on dividend policy (Simons, 1994; Charitou and Vafeas, 1998). DeAngelo and DeAngelo document a high incidence of dividend reductions by firms with persistent losses, but provide no similar evidence for firms with transitory losses. DeAngelo *et al.* conclude that an annual loss is a

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necessary condition for dividend reductions in firms with established earnings and dividend records.[1] So far as the impact of cash flows on dividend policy is concerned, no research to date has established an association between cash flows and dividend changes, given earnings.[2] Nevertheless, a positive association is hypothesized for two reasons: (a) cash flows are a more direct liquidity measure than earnings (Charitou and Vafeas, 1998),[3] and (b) managers may manipulate earnings to maximize bonuses, meet debt covenants or fend off political pressure. For these reasons, then, cash flow is expected to be a more reliable indicator of firm performance than earnings (Healy, 1985).[4] Finally, the simultaneous effect on dividend policy of cash flows and losses has not yet been considered.

All the aforementioned studies have relied on data from Anglo-Saxon (i.e., U.S.A., U.K., Australia) countries to examine the dividend policy issue. Even though recently fund managers worldwide have substantially increased their exposure to the Japanese capital markets, there has been no empirical evidence linking dividend changes to earnings and cash flows in these markets (Chan *et al.*, 1991). The present study is motivated by (a) the increased attention to Japanese capital markets, (b) the sparse empirical evidence linking dividend changes to earnings, losses and cash flows in Japan, (c) the emphasis in cash flow reporting worldwide, and (d) the inconclusive results of prior studies. It seeks to investigate the effect of earnings, cash flows and losses on dividend changes and differs from prior studies in several respects. First, it examines the effect of both annual losses and cash flows on dividend policy, while second, it examines dividend behaviour around losses using data from public Japanese firms. Japanese data are used because their financial reporting system differs from the Anglo-Saxon system in its emphasis on conservatism. In Japan earnings are seen as sources of funds for dividend distribution, whereas in the Anglo-Saxon countries they tend to be regarded as a corporate performance measure (Haskins *et al.*, 1996).

A sample of 529 Japanese firms is studied for the period 1984–95. Results show that: (a) cash flows have information content beyond earnings and losses in explaining dividend changes, (b) annual losses affect dividend changes, beyond earnings, and (c) dividend reductions, current operating earnings and cash flows have information content in explaining future earnings. Annual losses are also shown to be a necessary but not a sufficient condition for dividend reductions in firms with established earnings and dividend records.

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[1] The term 'necessary condition' means that there is a greater possibility that a firm will reduce its dividends if it incurs losses.

[2] Fama and Babiak (1968) and Hagerman and Huefner (1980) examined this issue defining cash flow as income plus depreciation. This measure was shown to be a profitability rather than a liquidity measure (see Bowen *et al.*, 1986; Charitou and Ketz, 1990, 1991).

[3] Charitou and Vafeas (1998) conclude that cash flows are associated with dividend changes: (a) when cash flows are relatively low compared to earnings, and (b) when firm growth opportunities are moderate.

[4] Brigham and Gapenski (1994) state: 'we normally think of earnings as being the primary determinant of dividends, but in reality cash flows are even more important . . . dividends clearly depend more on cash flows, which reflect the company's ability to pay dividends, than on current earnings, which are heavily influenced by accounting practices and which do not necessarily reflect the ability to pay dividends' (p. 530).

FINANCIAL REPORTING IN JAPAN

Significant accounting, economic, tax, institutional and cultural differences exist between Japan and Anglo-Saxon countries reflected in security prices and such market-derived indicators as P/E ratios and dividend yields (see Table 1; Haskins *et al.*, 1996, Nobes and Parker, 1995). Relative to the US, Australian and U.K. GAAP, the Japanese GAAP reveals several current income-reducing practices such as depreciation methods, bad debts, contingent reserves, etc.[5] Managers in Anglo-Saxon countries have little incentive to aggressively anticipate such charges against earnings, given the stock market's preference for higher reported earnings and the preponderance of executive compensation plans linked to security prices and earnings. In addition, significant off-balance sheet assets and liabilities that exist in Japan also result in understated earnings-related ratios (i.e., operating leases).[6] The Japanese conservative accounting practices are largely explained by the legal requirement that expenses claimed for tax purposes correspond to those claimed for financial reporting purposes. Japanese managers often choose an accounting practice that maximizes tax benefit, rather than one that reflects the firm's true economic status. Thus, unlike their Anglo-Saxon counterparts, Japanese managers are unable to pursue the dual objectives of minimizing taxable income while maximizing accounting earnings (Haskins *et al.*, 1996). Moreover, because the Japanese focus on long-term profitability as opposed to short-run earnings, there is less emphasis in providing earnings and other financial information useful to making economic decisions (Nobes and Parker, 1995).[7]

[5] Japanese firms with large capital investments tend to have substantially distorted earnings because they predominantly use accelerated depreciation methods.

[6] Differences in financial ratios such as liquidity and solvency are not just the result of accounting differences but also differences in the financial systems and norms of these countries. In Japan, for example, higher levels of liquidity and solvency are considered normal relative to the Anglo-Saxon firms because of longer term relationships with bankers and suppliers. The conservative valuation of debt and the propensity to finance debt tend to cause Japanese companies to appear to be substantially less solvent than their U.S. counterparts (Cooke, 1993; Haskins *et al.*, 1996; Nobes and Parker, 1995).

[7] This is due to (a) management job security in Japan being higher than in the Anglo-Saxon countries, (b) the heavy involvement of banks in financial reporting and the long-term nature of share ownership, and (c) corporate earnings in Japan being seen as the source of funds that can be distributed as dividends if the shareholders so desire. Management's greater job security in Japan partially results from Japanese corporate shares being held largely by related commercial banks, trade suppliers and corporate customers who are more interested in maintaining and strengthening functional business ties than short run stock market gains. Accordingly, corporate shares are normally held over long-term horizons regardless of short-term market performance (Choi *et al.*, 1983). The heavy involvement of banks in financial reporting and the long-term nature of share ownership means that there is less focus on short-term earnings information in Japan than in the U.S. Banks have direct access to their clients' accounting information, and so have relatively little interest in external financial reporting. (Hodder and Tschoegl, 1985; Allen, 1992).

TABLE 1

MAJOR DIFFERENCES IN FINANCIAL REPORTING BETWEEN JAPAN AND THREE ANGLO-SAXON COUNTRIES (U.S., AUSTRALIA AND U.K.)[a]

Item	Japan	U.S.	Australia	U.K.
Alignment of financial and tax accounting	High level	Low level	Low level	Low Level
Cash flow statement	Not required by commercial law, but required by securities law for parent companies as supplementary (not subject to audit)	Required (SFAS 95, 1987)	Required (AASB 1026, AAS 28, 1991)	Required (FRS 1)
Asset valuation	Historical cost (applied conservatively)	Historical cost with selected revaluation (principally downward)	Principally historical cost with selected revaluation	Historical cost with revaluation adjustment permitted
Major suppliers of funds	Banks and government	Small investors and other organizations	Small investors and other organizations	Small investors and other organizations
Sources of influence	Government: commercial law, securities exchange, tax regulation; banks; macro based with legal emphasis	Stock exchange; FASB; SEC; accounting profession; law	Stock exchange, accounting profession, company law, U.S. and U.K. financial reporting and capital markets	Stock exchange, accounting profession, company law, European Union
Depreciation	Usually accelerated methods, although straight line method is permitted.	Usually straight line method, based on useful economic life; accelerated methods are also permitted.	Usually straight line method	Usually straight line method
Goodwill	Capitalized and amortized normally over five years; negative goodwill is permitted	Capitalized to balance sheet over maximum of forty years; negative goodwill is not permitted.	Capitalized and amortized over a maximum of twenty years; negative goodwill is permitted.	Principally charged off against equity reserves but capitalization is permitted

TABLE 1 (cont'd)

Item	Japan	U.S.	Australia	U.K.
Interest capitalization	Generally not practised except in certain circumstances, not including income taxes	Required for self-constructed assets	Permitted but it is not required	Permitted but not widely practised
Deferred income taxes	Accounting income strongly influenced by tax rules; generally unrecorded due to the proximity of book and taxable income	Full deferral; computed under liability method	Computed under a comprehensive liability approach	Computed under liability method (less restrictive than U.S.)
Research and development	Expensed as incurred, except for new products, techniques or markets deferred and amortized over five years	R&D expensed as incurred, except development costs in certain industries (software, oil and gas)	Can be deferred if they are expected to be recoverable	Research costs always expensed; development costs may be capitalized under certain circumstances
Construction contracts	Completed contract and percentage of completion methods permitted	Percentage of completion method	Completed contract and percentage of completion methods permitted	Completed contract and percentage of completion methods permitted
Leases	All leases are treated as operating leases	Both capital and operating leases are permitted; Operating leases are also disclosed in footnotes	Finance leases capitalized, operating leases disclosed in footnotes	Financing leases capitalized, operating leases disclosed in footnotes

[a] See Radebaugh and Gray, 1986; Nobes and Parker, 1995; Haskins *et al.*, 1996; Lawrence, 1996 for more information about the major differences in financial reporting between Japan and these Anglo-saxon countries.

Because Japanese financial reporting systems differ from Anglo-Saxon systems, security analysts have opted for fewer traditional financial indexes, particularly those less sensitive to the differences in accounting practices (e.g., cash flow measures). Since operating cash flows inherently remove many of the differences in accounting practices (e.g., depreciation and other non-cash revenues and expenses), the price to cash flow ratio and cash flow per share are generally used by financial analysts instead of the traditional P/E ratio as a benchmark to compare investments in different countries (Haskins *et al.*, 1996).[8]

In summary, empirical research has not quite kept pace with the Japanese stock market's rapid growth. Studying a market as important as the Japanese stock market is of interest in its own right. The results of this study, combined with extant Anglo-Saxon research, can provide valuable information for evaluating empirical models of the association between dividend changes and earnings-cash flows. On the one hand, finding that the same financial variables are associated with dividend changes in both systems would strengthen our confidence in the extant Anglo-Saxon evidence. On the other hand, finding that different factors affect dividend changes in the two systems would suggest further research exploring institutional or behavioural differences between the two systems.

MOTIVATION AND DEVELOPMENT OF THE HYPOTHESES

The Association of Dividend Changes with Annual Losses and Earnings (Levels and Changes)

Dividend policy is considered one of the most crucial issues for management decision because it seems an important way for companies to communicate with market participants. Investors cannot always trust managers to provide unbiased information about their companies' prospects, but dividend signals are relatively reliable because they require cash payments and cash cannot be easily manipulated.[9] Tests of the significance of dividend changes showed that capital markets react favourably to 'good news' announcements (dividend increases) and adversely to 'bad news' announcements (dividend decreases), supporting the view that dividend changes have information content (Michaely *et al.*, 1995).

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[8] The commercial code in Japan does not require the preparation of a cash flow statement. However, there is a requirement for corporations whose securities are traded on a Japanese stock exchange to disclose extensive cash flow information in the supplementary schedules filed with the Ministry of Finance. The format of the funds statement differs from a typical Anglo-Saxon cash flow statement. A Japanese funds flow statement requires use of the direct method and therefore does not provide a link between earnings and operating cash flows. This funds flow statement is not audited and covers at least the prior and current year and a forecast for the next six months (Nissan *et al.*, 1995).

[9] Other factors that may explain the investors' preference for dividends are as follows: (a) Dividends represent present-value cash inflow to the investors that cannot be lost if the firm later experiences difficulties. This fact makes dividends less risky than capital gains. (b) Dividends reveal liquidity, so the payment of cash dividends carries information that the firm is strong and healthy. (c) Cash dividends provide current income to investors who require income from their investments. (d) Dividends provide signals to investors regarding future earnings and future cash flows of a company (French and Poterba, 1991; Rao *et al.*, 1992; Michaely *et al.*, 1995).

TABLE 2

SUMMARY RESULTS OF THE EMPIRICAL EVIDENCE ON THE ASSOCIATION OF DIVIDENDS WITH FINANCIAL AND MARKET INFORMATION

Study	Dividend issue examined[a]	Sample size	Testing period	Explanatory variables	Empirical results
Benartzi *et al.* (1997): do changes in dividends signal the future or the past?	3	7,186 observations	1979–91	Earnings changes are a function of dividend changes and dividend dummy (1 decreases and 0 increases)	Firms that increase dividends in year 0 have experienced significant earnings increases in years –1 and 0, but show no subsequent unexpected earnings growth. The size of the dividend increase does not predict future earnings. Firms that cut dividends in year 0 have experienced a reduction in earnings in year 0 and year –1, but these firms show significant increases in earnings in year 1. Firms that increase dividends are less likely than nonchanging firms to experience a drop in future earnings. Firms that increase dividends have significant positive excess returns for the following three years
Charitou and Vafeas (1998): the association between operating cash flows and dividend changes	1, 2	5,997 observations	1981–91	Operating income, cash flow from operations, lag dividends, growth ratio	There exists a positive relationship between dividend changes and cash flows: (a) when operating cash flows are low compared to earnings, and (b) when firm growth is moderate
DeAngelo and DeAngelo (1990): dividend policy and financial distress: An empirical investigation of troubled NYSE firms	1	Eighty firms that experienced multiple losses (three or more consecutive years)	1980–5	Dividend cuts are a function of change in earnings, the number of continuous years the firm has paid dividends, binding debt covenants and losses	There exists a high incidence of dividend cuts in firms that, (a) report multiple losses, (b) face binding debt covenants in the year they reduce dividends. Absent binding debt covenants, dividends are cut more often than omitted. Managers of firms with long dividend histories appear particularly reluctant to omit dividends

DeAngelo *et al.* (1992): dividends and losses	1, 3	Loss sample = 167 firms No-loss sample = 440 firms	Testing period: 1980–5 Sample period: 1970–85	Dividend changes are a function of: net income (levels and changes), annual losses (dummy), lag dividends; special items; extraordinary items	An annual loss is a necessary condition for dividend reductions in firms with established earnings and dividend records
DeAngelo *et al.* (1996): reversal of fortune; dividend signalling and the disappearance of sustained earnings growth	3	145 NYSE firms whose annual earnings decline after nine or more continuous years of growth	1980–7	Abnormal future earnings are a function of historical earnings growth rate, current and past earnings and dividend signal	Results provide no support for the notion that dividend decisions help identify firms with superior future earnings. Dividends tend not to be reliable signals because: (a) a behavioural bias (overoptimism) leads managers to overestimate future earnings when growth prospects fade, and (b) managers make only modest cash commitments when they increase dividends, undermining the reliability of such signals.
Fama and Babiak (1968): dividend policy; an empirical analysis	1, 2			Net income, prior year dividends, 'cash flow' = net income + depreciation, working capital	Net income and previous year dividends are the basic determinants of dividend changes
Hagerman and Huefner (1980): earnings numbers and dividend prediction	1, 2			Net income, prior year dividends 'cash flow' = net income + depreciation, net income depreciation, working capital	Net income and prior year dividends are the most important determinants of dividend changes
Healy and Palepu (1988): earnings information conveyed by dividend initiations and omissions	3	Dividend initiation sample = 131 Dividend omission sample = 172	1970–9 1969–80	Change in earnings is a function of the market adjusted return, lag change in earnings for the dividend initiation and dividend omission announcements	Firms that initiate dividend payments have positive earnings changes both before and after the dividend policy change, while those omitting dividend payments have negative earnings changes
Kormendi and Zarowin (1996): dividend policy and permanence of earnings	1	337 firms	1950–89	Permanent earnings, earnings (levels and changes)	Dividends are changed primarily in response to permanent changes in earnings. Transitory earnings changes have little or no effect on dividends. Results are more consistent with a model that relates dividend and earnings changes rather than levels. Earnings and dividends are not co-integrated. This contrasts with the implicitly co-integrated (levels) dividend model of Lintner (1956), and indicates that factors other than the permanent components of earnings, such as tax policy, clientele effects, transaction costs, may have an impact on the long-run behaviour of dividends

TABLE 2 (cont'd)

Study	Dividend issue examined[a]	Sample size	Testing period	Explanatory variables	Empirical results
Jensen and Johnson (1995): the dynamics of corporate dividend reductions	3	268 observations (218 cases of dividend reductions and 50 cases of dividend omissions)	1974–89	Twenty-one firm characteristics three years before and three years after a dividend drop: net income, operating income, stock price sale, CGS, SGA, current liabilities, acid assets, debt ratio, long debt financing, equity financing, sales and purchases of fixed assets, labour expenses, number of employees, R&D, advertising expenses	Firm earnings drop prior to a dividend reduction and increase afterwards. Following a dividend drop, firms tend to reduce asset expenditures, external financing activities, employees, and spending on R&D. Firms tend to sell more assets and their sales level remains depressed in the post-dividend-drop period. Overall, a dividend-drop marks the end of a firm's financial decline and the beginning of firm restructuring
Lintner (1956): distribution of income of corporations among dividends, retained earnings and taxes	1		Training period: 1918–41 Testing period: 1942–51	Net income; prior year dividends	The basic determinants of dividends changes are: net income and prior year dividends. Firms attempt to maintain a steady stream of dividends and firms tend to make a periodic partial adjustments to a target payout ratio rather than dramatically changing their payout when a change in earnings occurs. In the short run, dividends are smoothed to avoid frequent changes
Michaely *et al.* (1995): price reactions to dividend initiations and omissions; overreaction or drift?	4	Initiations sample = 561 Omissions sample = 887	1964–88	Excess returns around a dividend initiation and omission announcement	The magnitude of short-run price reactions to omissions are greater than for initiations. Omission announcements are associated with a mean price drop of 7 per cent and initiations are associated with a price increase of over 3 per cent
March and Mertons (1987): dividend behaviour for the aggregate stock market	1		1926–81	Permanent earnings, lag dividends accounting earnings	Permanent earnings is the basic component of dividend changes

Miller and Modigliani (1961): dividend policy, growth and the valuation of shares	1, 3, 4	n/a	n/a	Theoretical	Dividend policy has no effect on either the price of a firm's stock or its cost of capital. The value of the firm is determined by its basic earnings power and its risk class and not on how earnings are split between dividends and retained earnings. MM proved that their proposition holds in theory only under these assumptions: (a) no personal or corporate taxes; (b) no stock flotation or transaction costs; (c) investors are indifferent between dividends and capital gains; (d) the firm's capital investment policy is independent of its dividend policy; (e) investors and managers have the same set of information regarding future investment opportunities. Dividend changes depend on management's expectations of future earnings. Dividend reductions convey information that future earnings prospects are poor
Simons (1994): the relationship between dividend changes and cash flow	1, 2	441 firms	1984–5	Cash flow from operations, free cash flow, total cash flow, net income, lag dividends	None of the proposed cash flow measures convey information about dividend changes beyond earnings
Thomson and Watson (1989): historic cost and current cost earnings and the dividend decision	1	180 firms	1980–1	Profit after depreciation, profit after interest, profit before extraordinary items, net income, operating income plus depreciation	Historic cost profits provide the best explanation for dividend changes

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[a] 1 = Relationship between dividends and earnings (losses); 2 = Relationship between dividends and cash flows, earnings, losses; 3 = Relationship between dividends and future earnings; 4 = Relationship between dividend announcements and returns.

Since Lintner's seminal study, earnings have been considered the dominant factor in explaining dividend changes. Although numerous studies have examined other potential factors that may influence dividend policy, the majority of these have focused on U.S. data.[10] As stated earlier, despite the rapid growth and importance of Japanese capital markets, there has been no other study researching the effect of dividend policy on the Japanese market. For this reason and because financial reporting practices in Japan are the furthest removed from Anglo-Saxon norms (manifested in substantially under-reported earnings), the present study will investigate:

H1: There exists a positive association between earnings measures (losses, levels and changes in operating earnings) and dividend changes in a pooled Japanese sample of (a) firms that report losses and (b) firms that report positive but declining operating earnings.[11]

Under this hypothesis, the slope coefficient of earnings and losses is expected to be positive, signifying the incremental importance of earnings and losses in explaining dividend changes. In other words, it is expected that firms reporting losses will reduce dividends in the loss year.[12] There are two possible explanations for these dividend reductions in the year of initial losses. First, to avoid violation of debt covenants. Second, because an operating loss reveals a deterioration in the firm's profitability, reduced dividends can provide the funds required for the firm's normal operations and to meet their legal obligations (DeAngelo and DeAngelo, 1990).

The Association of Dividend Changes with Cash Flows, Given Annual Losses and Earnings

Although earnings are considered the dominant measure of performance in the marketplace, the existence of information asymmetries between management and the suppliers of capital has led to the demand for other measures of performance, especially cash flows. Earnings can be criticized because: (a) management has some discretion over the recognition of certain accruals, which discretion can be used to convey private information or manipulate earnings; and (b) earnings do not fully capture the firm's liquidity position. These limitations make accrual earnings a less reliable determinant of dividend policy. Lawson (1996, 1997a, 1997b) contends that dividend policies based on accrual earnings are inconsistent with *ex ante* shareholder value creation (SVC) model, that is, to maximize firm value organizations should invest in projects with positive net present values while simultaneously considering firm liquidity (cash flows). Dividend policies based on accrual earnings can result in: (a) deterioration of a firm's liquidity and solvency, (b) dividend payments that cannot be internally financed, (c) external borrowing to partially finance dividends, and (d) increased financing costs leading to a transfer of shareholder wealth to lenders. This occurs whenever funds must be raised through debt, and ultimately increases the firm's risk (Whittington and Meeks, 1976; Lawson and Stark, 1981).[13] Proponents of cash flow reporting also argue that cash flows are not affected by arbitrary allocations and cannot be easily manipulated by management (Lee, 1978, 1981; Lawson, 1981). Since dividends must be paid in cash, firms reporting insufficient cash may be forced to reduce dividends. Thus, it is expected that firms will reduce dividends in years of insufficient liquidity. Further, research indicates that: (a) higher dividend payout ratios correspond to larger cash flows, and (b) firms that persistently generate more operating cash flow than earnings are likely to have higher dividend payout ratios (Ingram and Lee, 1997).

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[10] Other extensions of Lintner's study include: (a) the managerial expectation of future earnings and dividend changes (Modigliani and Miller, 1959; Miller and Modigliani, 1961); (b) the impact on dividend policy when firms face financial distress (DeAngelo and DeAngelo, 1990; (c) the effect of fund flows and cash flows on dividend changes (Simons, 1994; Charitou and Vafeas, 1998); (d) current cost earnings and dividend changes (Thompson and Watson, 1989); (e) the behaviour of earnings before and after a dividend initiation or omission (Healy and Palepu, 1988); and (f) the behaviour of several financial ratios before and after a dividend drop (Jensen and Johnson, 1995). See Table 2 for a detailed description of the major characteristics of prior dividend studies.

[11] The event year in all hypotheses for loss (non-loss) firms is the first year that the firm reported losses (declining profits) during the period 1990–4.

[12] The loss sample contains firms (a) that reported at least one annual loss during the period 1990–4, and (b) those that reported positive operating net income and paid cash dividends in each of the five years immediately prior to their first annual loss.

On the other hand, cash flows are an insufficient and noisy measure of performance in so far as they are influenced by timing and matching problems (Dechow, 1994). Thus, due to their inherent limitations, neither cash flow nor earnings can be used in isolation to explain dividend policy choices. Furthermore, there is evidence suggesting that dividend reduction is the result of a deterioration in both the profitability and the liquidity of a firm (Jensen and Johnson, 1995).

Thus, the lack of any established association between cash flows and dividend policy, given earnings; the contradictory research on the usefulness of cash flows in setting dividend policy; the inherent limitations of earnings as a reliable determinant of dividend policy; and the scant empirical evidence linking cash flows and annual losses with dividend changes using Japanese data point to:

H2: There exists a positive association between cash flow measures and dividend changes, given earnings in a pooled Japanese sample of (a) firms that report losses and (b) firms that report positive but declining earnings.

According to this hypothesis, the slope coefficient of cash flow measures is expected to be positive, signifying the importance of cash flows in explaining dividend changes. Specifically, firms with cash flow deficiencies are more likely to reduce dividends because of the need to repay debt obligations and to raise cash for the firm's normal operations.

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[13] Lawson and Stark (1981) also show that: (a) a significant proportion of dividends during the period 1961–77 was debt-financed and that such debt–equity substitution accounts for about 40 per cent of the decline in equity values during that period, and (b) U.K. companies have based their dividend policies on accrual profits and that by distributing approximately 40 per cent of their earnings, failed to realize that distributed dividends exceeded entity cash flows. Entity cash flow is defined as the difference between operating cash flows and replacement investment (Lawson and Stark, 1981; Lawson, 1996). This definition is intuitively appealing because it also reflects the financial policy of the organization, that is, the division of the net cash flows between equity financing (by shareholders) and debt financing (by creditors).

The Information Content of Dividend Reductions, Earnings and Cash Flows as Predictors of Future Earnings

Miller and Modigliani (1961) showed that management's superior assessment of the firm's prospects could be inferred from dividend changes, with dividend increases (reductions) signalling good (bad) news about future earnings. DeAngelo *et al.* (1992) have also argued that dividends and current earnings are likely substitutes for forecasting future earnings and that the information content of dividends will vary depending on the characteristics of current earnings. Dividends are expected to have low (high) explanatory power in random (nonrandom) samples because current earnings are expected to be more (less) reliable. Existing evidence on the information content of dividends is consistent with the above arguments. Watts (1973) and Benartzi *et al.* (1997) observed a weak association between unexpected earnings and dividend changes for randomly selected firms. Using nonrandom samples, DeAngelo *et al.* (1992) and Healy and Palepu (1988) indicate that dividend reductions have incremental information content in predicting future earnings, given current earnings.[14] Cash flows are also expected to be statistically significant in forecasting future earnings in nonrandom samples because loss firms generally experience earnings reversion after the initial loss, suggesting current earnings will be less useful in forecasting future earnings than in normal circumstances where earnings follow a random walk (DeAngelo *et al.*, 1992). The Japanese loss firms studied have certainly experienced extreme earnings and therefore offer a reasonable sample to examine whether dividends and cash flows explain future earnings, given current earnings. These contentions suggest:

H3: There exists a positive association between dividend increases and future earnings, given current earnings and cash flows in a pooled sample of Japanese firms.

According to this hypothesis, the slope coefficients of the dividend changes, earnings and cash flow variables are expected to be positive. A positive sign for the dividend changes variable implies that decreases (increases) in current dividends will lead to decreases (increases) in future earnings.

RESEARCH DESIGN

Data Set

The sample consists of 529 Japanese firms included in the Global Vantage database for the period 1984–95 that fulfil the following criteria: (a) availability of data to calculate the level and changes in operating earnings, the level and changes in operating cash flows, and the return on equity; (b) availability of quarterly dividends and dividends per share; and (c) availability of the market value of equity at fiscal year end. All industrial firms that met the above criteria were included in the initial

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[14] Using a nonrandom sample of 145 NYSE firms, DeAngelo *et al.* (1996) found that dividend decisions do not help identify firms with superior future earnings.

FIGURE 1

DATA SELECTION CRITERIA

A. Loss sample ($n = 191$)

1985–9	1990–4
(a) Positive earnings in all years (b) Paid cash dividends in all years	(a) At least one annual loss during the period 1990–4[a]

A. Non-loss sample ($n = 338$)

1985–9	1990–4
(a) Positive earnings in all years (b) Paid cash dividends in all years	(a) Only earnings (no losses) in all years during the period 1990–4 (b) A decline in earnings in at least one year during the period 1990–4

[a] For firms in the loss sample, the event year is the firm's initial loss year. For firms in the non-loss sample, the event year is the first year during 1990–4 that the firm reported a decline in operating earnings. Positive earnings and positive cash dividends are required in all five years preceding the event year. For example, if the event year is 1990 then positive earnings and positive cash dividends are required in all five years from 1985–9. If on the other hand the event year is 1994, then positive earnings and positive cash dividends are required in all five years prior to 1994, that is, 1989–93.

sample and subsequently categorized as loss (191 firms) and non-loss (338 firms) samples.[15]

Loss Sample This subsample consists of firms that (a) reported at least one annual loss during the period 1990–4 and (b) reported positive dividends and positive operating earnings for all five years immediately prior to their first annual loss.

Non-Loss Sample This subsample consists of firms that (a) reported only earnings (no losses) during the period 1990–4, (b) reported positive dividends and positive operating earnings for all five years immediately prior to their first earnings decline, and (c) reported a decline in operating earnings for at least one year during the period 1990–4. The event year for this subsample is the first year during the period 1990–4 in which the firm reported a decline in operating earnings. Similar to DeAngelo *et al.* (1992) the analysis focuses on declining earnings years for non-loss firms because firms seem less likely to cut/omit dividends when earnings are positive and increasing. Figure 1 indicates the criteria used for the two subsamples.[16]

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[15] The sample includes industrial firms that belong to the following industries: manufacturing (SIC 1–4299, 4400–4799); retail (SIC 5000–5999); and service (SIC 7000–7999). Financial institutions and utilities were excluded from the sample. In order to ensure that the results are not affected by outliers, extreme observations (outliers) with absolute studentized residuals greater than three were excluded from the sample (Benartzi *et al.*, 1997, p. 1021). This did not alter the substance of the results.

[16] The reason for using information for the periods 1985–9 and 1990–4 is that the Global Vantage database has data available for the period 1983–95. Data for the year 1995 were used to forecast earnings and data for the years 1983–4 were used to estimate changes in cash flows and changes in earnings.

Empirical Models

The empirical models used to test the research hypotheses relate to: (a) the association of dividend changes with earnings, losses and cash flows; and (b) dividend reductions as predictors of future earnings and cash flows.

The Association of Dividend Changes with Earnings, Losses and Cash Flows The association of dividend changes (ΔDIV) with the loss dummy (lossdum), the level and changes of operating earnings (E, ΔE) and the level and changes in operating cash flows (CFO, ΔCFO) were tested using empirical models:

Univariate Analysis:

(1) $\Delta DIV = b_0 + b_2\,E$

(2) $\Delta DIV = b_0 + b_3\,\Delta E$

(3) $\Delta DIV = b_0 + b_1\,\text{lossdum}$

(4) $\Delta DIV = b_0 + b_4\,CFO$

(5) $\Delta DIV = b_0 + b_5\,\Delta CFO$

Multivariate Analysis:

(6) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_2\,E$

(7) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_3\,\Delta E$

(8) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_4\,CFO$

(9) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_5\,\Delta CFO$

(10) $\Delta DIV = b_0 + b_2\,E + b_3\,\Delta E$

(11) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_2\,E + b_3\,\Delta E$

(12) $\Delta DIV = b_0 + b_4\,CFO + b_5\,\Delta CFO$

(13) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_4\,CFO + b_5\,\Delta CFO$

(14) $\Delta DIV = b_0 + b_2\,E + b_3\,\Delta E + b_4\,CFO + b_5\,\Delta CFO$

(15) $\Delta DIV = b_0 + b_1\,\text{lossdum} + b_2\,E + b_3\,\Delta E + b_4\,CFO + b_5\,\Delta CFO$

where change in cash dividends (ΔDIV) = a dummy variable that takes the value of zero if the firm announced a reduction (cut or omission) in its regular dividend in the year under study, otherwise it takes the value of one (increase or no change from one year to the next);[17]

lossdummy (lossdum) = zero (one) if the firm is in the loss (non-loss) sample;

operating earnings (E) = the net income before extraordinary items, discontinued operations, special and non-operating items;

change in operating earnings (ΔE) = the difference between current year earnings and prior year earnings;

cash flows from operations (CFO) = operating earnings plus noncurrent accruals (e.g., depreciation) plus net changes in all working capital accounts related to operations, except for changes in cash, and debt in current liabilities;

change in cash flow from operations (ΔCFO) = the difference between current year and prior year CFO.

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[17] Dividends are used with the 'overlap' definition: a dividend reduction is allocated to a particular year if it occurs in the second, third, or fourth quarter of that fiscal year, or in the first quarter of the following fiscal year (DeAngelo *et al.*, 1992).

TABLE 3

INCIDENCE OF REDUCTIONS IN COMMON STOCK DIVIDENDS FOR 191 INDUSTRIAL JAPANESE FIRMS WITH AT LEAST ONE ANNUAL LOSS DURING THE PERIOD 1990–4 AND 338 INDUSTRIAL FIRMS WITH POSITIVE BUT DECLINING OPERATING EARNINGS DURING THE PERIOD 1990–4

	Number of firms	Number of dividend		
		Reductions	Omissions	Reductions and omissions
Loss firms	191 (36.1%)	105 (54.9%)	47 (24.6%)	152 (79.6%)
Non-loss firms	338 (63.9%)	50 (14.8%)	3 (1%)	53 (15.7%)
Total	529 (100%)	155 (29.3%)	50 (9.5%)	205 (37.8%)

> In all models tested, the earnings (E, ΔE) and cash flow (CFO, ΔCFO) explanatory variables are deflated by the market value of equity at the beginning of the fiscal year.

The coefficients of the earnings and cash flow variables are expected to be positive, showing the incremental importance of earnings, losses and cash flows in explaining dividend changes.

Dividend Reductions as Predictors of Future Earnings The following models are used to test the effect of dividend reductions (ΔDiv_t), current cash flows (CFO_t) and current earnings (E_t) as predictors of future earnings (E_{t+1}):

(16) $E_{t+1} = a_0 + a_1 E_t$
(17) $E_{t+1} = a_0 + a_1 CFO_t$
(18) $E_{t+1} = a_0 + a_3 \Delta Div_t$
(19) $E_{t+1} = a_0 + a_1 CFO_t + a_2 CFO_t$
(20) $E_{t+1} = a_0 + a_1 E_t + a_3 \Delta Div_t$
(21) $E_{t+1} = a_0 + a_2 CFO_t + a_3 \Delta Div_t$
(22) $E_{t+1} = a_0 + a_1 E_t + a_2 CFO_t + a_3 \Delta Div_t$

where E = operating earnings;
CFO = cash flow from operations;
ΔDIV = change in cash dividends (dummy);
t = year of first annual loss (event year).

> Earnings (E) and cash flows (CFO) are deflated by the market value of equity at the beginning of the fiscal year.

Incidence of Dividend Reductions in the Loss and Non-Loss Samples
Results in Table 3 show a relatively high incidence of dividend reductions and omissions in the loss sample (LS): 105 (54.9 per cent) firms reduced dividends and 47 firms (24.6 per cent) omitted dividends, totalling 152 firms (79.6 per cent). The 79.6 per cent dividend reduction/omission rate for the LS firms measures the incidence with which firms cut/omit dividends in their first year of negative earnings

Table 4

INCIDENCE OF DIVIDEND REDUCTIONS FOR DIFFERENT LEVELS OF RETURN ON EQUITY (JAPANESE POOLED [LOSS AND NON-LOSS] SAMPLE; $N = 529$)

Return on equity	Number of reductions	% category	Total firms	
–10% or lower	38	79.2	48	
–10% to –8%	6	66.3	9	
–8% to –6%	10	58.4	17	Loss
–6% to –4%	19	59.9	34	sample = 191
–4% to –2%	17	50.0	34	
–2% to 0%	15	30.6	49	
0% to 2%	0	0	5	
2% to 4%	8	20.0	40	
4% to 6%	12	12.6	95	Non-loss
6% to 8%	20	18.3	109	sample = 338
8% to 10%	9	16.4	55	
above 10%	1	2.9	34	
Total	155	100%	529	

after at least five years of positive earnings and dividend payments. In contrast, analysis of the non-loss sample (NLS) points to a relatively low incidence of dividend reductions (14.8 per cent) and dividend omissions (1 per cent). This difference in the two rates indicates the importance and effect of annual losses on dividend policy, and suggests that a loss may actually cause dividend reductions. This evidence is consistent with prior U.S. results which posited the high likelihood of dividend reduction/omission during a loss year (DeAngelo *et al.*, 1992). The rate differences in the two samples also suggest the need to further examine the information content of annual losses on dividend policy for firms with established earnings and dividend records. Table 4 illustrates the incidence of dividend reductions for various levels of return on equity (ROE): rates for all intervals of negative ROE were consistently higher than for all positive ROE intervals; the reduction rate for the positive ROE firms ranging from 0 per cent to 20 per cent, while that for the loss firms varied between 30.6 per cent and 79.2 per cent. Thus, clearly there is a substantially higher incidence of dividend reductions when firms suffer losses and a relatively low incidence of dividend reductions when firms report positive earnings.

Descriptive Statistics

Descriptive statistics for the relevant variables for the pooled, loss and non-loss samples are presented in Table 5. Comparing earnings and cash flows of the pooled dataset (Panel A) reveals that the variability, mean and median of the level of cash flows (CFO) is greater, a result consistent with our expectations. Comparison of the non-loss (NLS) and loss (LS) samples (Panels B and C) indicates the following:

TABLE 5

DESCRIPTIVE STATISTICS[a]

Variable	Mean	Median	*SD*	Lower quartile	Upper quartile
Panel A: Pooled sample (n = 529)					
CFO	0.400	0.163	1.140	−0.037	0.552
ΔCFO	−0.330	−0.122	1.420	−0.524	0.131
ΔE	−0.080	−0.026	0.190	−0.084	−0.010
E	0.082	0.054	0.330	−0.016	0.135
ROE	0.015	0.047	0.092	−0.024	0.072
Panel B: Loss sample (n = 191)					
CFO	0.460	0.188	1.280	−0.060	0.740
ΔCFO	−0.370	−0.098	1.790	−0.601	0.273
ΔE	−0.170	−0.092	0.270	−0.168	−0.036
E	−0.110	−0.034	0.240	−0.089	−0.011
ROE	−0.076	−0.045	0.096	−0.101	−0.019
Panel C: Non-loss sample (n = 338)					
CFO	0.370	0.155	1.050	−0.030	0.504
ΔCFO	−0.310	−0.125	1.170	−0.482	0.108
ΔE	−0.030	−0.014	0.090	−0.037	−0.005
E	0.180	0.103	0.320	0.059	0.184
ROE	0.068	0.064	0.027	0.049	0.082

E = operating earnings; ΔE = Change in E; CFO = cash flow from operations; ΔCFO = Change in CFO; ROE = return on equity. E, CFO, ΔE, ΔCFO are deflated by the market value of equity at the beginning of the fiscal year.

[a] Since this study restricts attention to firms that fulfil certain criteria, we expected the following statistics to hold for the two subsamples: (a) the maximum for the change in earnings variable (ΔE) in both the loss (LS) and the non-loss (NLS) samples is 0; (b) the minimum (maximum) for the earnings levels (E) in the NLS (LS) is 0; and (c) the minimum (maximum) ROE in the NLS (LS) is 0.

(a) as expected, the mean and median values of both the earnings level (E) and ROE measures are lower for the loss sample firms; (b) the mean and median values of the CFO measures are greater for the loss sample firms; and (c) the variability of the earnings and cash flow measures is greater for the loss sample firms.[18]

[18] Correlation results are as follows: Analysis of the pooled sample indicates that: (a) the correlation between dividend changes and earnings, and dividend changes and cash flows is 0.114 and 0.099, respectively; (b) the correlation between E and CFO is 0.263; and (c) the correlation between earnings and dividend changes is higher than the correlation between cash flows and dividend changes. Comparing the correlation results of the two subsamples (loss and non-loss) suggests the following: (a) the correlation between earnings, cash flows and dividend changes is greater for the loss sample firms; (b) the correlation between earnings, cash flows and dividend changes is positive; and (c) the correlation between E and CFO is greater for the non-loss sample firms. In summary, the above correlation results are consistent with prior evidence (DeAngelo *et al.*, 1992; Charitou and Vafeas, 1998).

EMPIRICAL RESULTS

Empirical Evidence on the Association of dividend changes with losses, earnings and cash flows

Table 6 presents logistic regression results of the association of dividend reductions with losses, earnings and cash flows, both univariate (models 1–5) and multivariate (6–15).

Univariate Analysis Univariate analysis results indicate that annual losses, earnings (levels and changes) and cash flow levels (CFO) are positively associated with dividend changes (all statistically significant).[19] Comparing the R^2s of these models leads to two observations: the presence or absence of a loss has the highest explanatory power in the logit regressions ($R^2 = 16$ per cent); cash flows have the lowest explanatory power.[20]

Multivariate Analysis: The association of dividend changes with annual losses and earnings (levels and changes) Multivariate logistic results in Table 6 show that annual losses (lossdum) and earnings (E or ΔE or both) are statistically significant in explaining dividend changes (models 6, 7, 10, 11). Comparison of models 10 and 11 confirms that the explanatory power of annual losses beyond earnings (levels and changes) is substantial (R^2s 0.101 and 0.177, respectively). These results substantiate earlier U.S. evidence indicating the importance of annual losses in explaining dividend reductions. Contrary to our results, DeAngelo *et al.* (1992) showed that earnings do not have information content beyond losses in explaining dividend changes.[21]

Multivariate model results support H1, that is, that a positive and statistically significant association exists between dividend reductions and earnings (losses, levels and changes). Results show that (a) annual losses are associated with a higher likelihood of dividend reduction, and (b) higher earnings (levels and changes) correlate with a lower likelihood of dividend reduction. Further, results indicate annual losses to be an important determinant of dividend reductions in firms with established earnings and dividend records.

The association of dividend changes with cash flows, given annual losses and earnings Models 8, 9, 12–15 (Table 6) illustrate multivariate results of the association between dividend changes and cash flows (levels and changes), given earnings and losses. Logit results based on models 8, 9 and 13 indicate that cash flows (levels) are associated with dividend changes, given losses. Analysis of model 15 also shows

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[19] Logit analysis can test the hypothesis that a coefficient is different from zero by using the Wald statistic, which is similar to the F statistic of multiple linear regression, Wald = $F^2 = (b_i/S_{bi})^2$.

[20] These results are consistent with prior evidence which relates to the association of dividends/returns with earnings/cash flows. In all these studies the R^2s were relatively low (Lev, 1989).

[21] DeAngelo *et al.* (1992) state that this inconsistency in their results could be due to the high correlation between the level and changes of earnings in their U.S. sample (90 per cent). In our Japanese sample the correlation between the level and changes in earnings is 34.9 per cent.

Table 6

LOGIT ANALYSIS OF THE DECISION TO REDUCE DIVIDENDS FOR POOLED SAMPLE OF 191 JAPANESE INDUSTRIAL FIRMS WITH AT LEAST ONE ANNUAL LOSS DURING THE PERIOD 1990–4 AND 338 INDUSTRIAL FIRMS WITH POSITIVE OPERATING EARNINGS DURING THE PERIOD 1990–4

Model	Constant	E	ΔE	Lossdum	CFO	ΔCFO	Pseudo R^2
1	0.723 (6.950) (0.00)***	3.910 (5.280) (0.00)***					0.088
2	1.139 (10.119) (0.000)***		2.537 (4.266) (0.000)***				0.040
3	−0.247 (−1.676) (0.093)*			2.078 (9.591) (0.000)***			0.160
4	0.859 (8.758) (0.000)***				0.086 (1.803) (0.071)*		0.010
5	0.9075 (9.274)*** (0.000)					0.031 (1.037) (0.299)	0.001
6	−0.151 (−0.963) (0.335)	0.902 (1.70) (0.089)*		1.823 (7.196) (0.000)***			0.171
7	−0.046 (−0.275) (0.464)		1.231 (2.186) (0.028)**	1.942 (8.695) (0.000)***			0.173
8	−0.303 (−1.998) (0.045)**			2.096 (9.571) (0.000)***	0.118 (1.852) (0.063)*		0.172
9	−0.234 (−1.576) (0.114)			2.075 (9.571) (0.000)***		0.026 (0.787) (0.429)	0.165
10	0.936 (7.348) (0.000)***	3.063 (4.330) (0.000)***	2.592 (2.910) (0.003)***				0.101
11	−0.001 (−0.001) (0.998)	0.508 (1.034) (0.300)	1.257 (1.860) (0.063)*	1.787 (7.021) (0.000)***			0.177
12	0.818 (7.681) (0.00)***				0.135 (1.865) (0.062)*	−0.053 (−0.943) (0.345)	0.010
13	−0.386 (−2.332) (0.019)**			2.016 (9.590) (0.000)***	0.209 (2.161) (0.031)**	−0.090 (−1.327) (0.185)	0.176
14	0.809 6.101 0.000***	3.488 4.223 0.000***	3.044 3.445 0.001***		0.396 2.998 0.003***	−0.121 −1.158 0.247	0.121
15	−0.124 (−0.683) (0.494)	0.245 (0.398) (0.689)	2.312 (2.996) (0.003)***	1.858 (7.070) (0.000)***	0.3797 (3.088) (0.002)***	−0.182 (−1.846) (0.065)*	0.200

Coefficient, *t*-statistic, *p*-value: first, second and third line, respectively. *, **, ***, significant at the 0.10, 0.05, 0.01 level, respectively; E = operating earnings; ΔE = change in E; CFO = cash flow from operations; ΔCFO = change in CFO; ΔDiv = change in dividends; Lossdum = loss dummy. E, CFO, ΔE, ΔCFO are deflated by the market value of equity at the beginning of the fiscal year; *Z*-statistic = square root of Wald statistic = b_i/standard error of b_i.

that cash flows (level) have incremental explanatory power beyond losses and earnings in explaining dividend changes ($R^2 = 0.20$). As hypothesized, the coefficient of cash flow levels is positive and statistically significant at a = 0.01. The coefficient of cash flow changes is marginally significant (a = 0.10). Results also indicate that annual losses and earnings are positively associated with dividend changes.

In summary, these multivariate model results support H2, that is, that there is a positive association between dividend reductions and cash flows, given earnings and losses. In all models tested, the coefficient of annual losses is always statistically significant at a = 0.01, with the loss variable having the highest explanatory power. Therefore, annual losses are a necessary—but probably not a sufficient—condition in explaining dividend changes. In addition, at least one earnings and at least one cash flow measure were found to be statistically significant in all models tested. These results lead us to conclude that not only annual losses, but also earnings and cash flows, are useful in explaining dividend changes in Japan.

The Information Content of Dividend Reductions, Earnings and Cash Flows as Predictors of Future Earnings

Regression results of the association of dividend reductions, current earnings and current cash flows with future earnings (Table 7) confirm H3, which posits that dividend reductions and current cash flows are predictors of future earnings. The coefficients of the dividend reduction, earnings and cash flow variables are positive and statistically significant in all models tested, verifying that cash flows have information content in explaining future earnings. Univariate analysis reveals cash flows as the most significant explanatory variable for variation in future earnings (see model 17, $R^2 = 9.34$ per cent). Multivariate regression analysis (models 19, 21, 22) also indicates an association between current cash flows and future earnings, given earnings and losses. Thus, the dividend reduction variable remains significantly and positively related to future earnings, irrespective of the presence of earnings and/or current cash flows in the model. The same conclusions can be drawn for the cash flow variable, that is, that it is positively associated with future earnings, given current earnings and dividend reductions. The present Japanese results are also consistent with earlier U.S. studies (DeAngelo *et al.*, 1992).

Sensitivity Analysis

Additional statistical tests were performed to ascertain the robustness of the results. First, a new non-loss sample of firms with increasing, positive earnings was employed. Second, regression analysis was used to examine the linear relationship between dividend changes and earnings, losses and cash flows.[22] Neither analysis revealed any discernible changes in the interpretation of the results. The next section describes these alternative approaches and their impact on the empirical results.

Sample of Firms with Increasing, Positive Earnings Two sub-samples of firms were used in the regressions presented so far: loss sample of firms with losses in at least

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[22] These two alternative approaches which examine the robustness of the results were suggested by the two anonymous reviewers of this article.

TABLE 7

191 INDUSTRIAL JAPANESE FIRMS WITH AT LEAST ONE ANNUAL LOSS DURING THE PERIOD 1990–4 OLS REGRESSIONS OF FUTURE EARNINGS (E_{T+1}) ON CURRENT EARNINGS (E_T), CURRENT CASH FLOWS (CFO_T) AND CHANGES IN DIVIDENDS (ΔDIV_T)

Models:
(16) Future $E_{t+1} = a_0 + a_1$ Current E_t
(17) Future $E_{t+1} = a_0 + a_2$ Current CFO_t
(18) Future $E_{t+1} = a_0 + a_3\,\Delta Div_t$
(19) Future $E_{t+1} = a_0 + a_1$ Current $E_t + a_2$ Current CFO_t
(20) Future $E_{t+1} = a_0 + a_1$ Current $E_t + a_3\,\Delta Div_t$
(21) Future $E_{t+1} = a_0 + a_2$ Current $CFO_t + a_3\,\Delta Div_t$
(22) Future $E_{t+1} = a_0 + a_1$ Current $E_t + a_2$ Current $CFO_t + a_3\,\Delta Div_t$

Coefficient (*t*-statistic) (*p*-value)

Model	16	17	18	19	20	21	22
Constant	−0.047** (−2.499) (0.013)	−0.100*** (−6.880) (0.000)	−0.128*** (−6.563) (0.000)	−0.059*** (−3.226) (0.002)	−0.082*** (−3.222) (0.002)	−0.137*** (−7.290) (0.000)	−0.092*** (−3.752) (0.000)
Current E	0.413*** (3.527) (0.000)			0.402*** (3.595) (0.000)	0.334*** (2.723) (0.008)		0.326*** (2.795) (0.006)
Current CFO		0.024*** (4.132) (0.000)		0.023*** (4.205) (0.000)		0.023*** (4.163) (0.000)	0.023*** (4.209) (0.000)
ΔDiv			0.088*** (2.997) (0.003)		0.061** (2.020) (0.045)	0.084*** (2.997) (0.003)	0.058** (2.003) (0.047)
Adjusted R^2	6.79%	9.34%	4.84%	15.82%	8.60%	13.78%	17.43%

Coefficient, *t*-statistic, *p*-value: first, second and third line, respectively. *, **, ***, significant at the 0.10, 0.05, 0.01 level, respectively. E = operating earnings; ΔE = change in E; CFO = cash flow from operations; ΔCFO = change in CFO; ΔDiv = change in dividends. E, CFO, ΔE, ΔCFO are deflated by the market value of equity at the beginning of the fiscal year.

one year during the period 1985–9, and a non-loss sample of firms with established earnings and dividend records and with declining earnings recorded in at least one year during the period 1990–4. Analysis of a new non-loss sample of firms with positive and increasing earnings in at least one year during the period 1990–4 (Table 8, models 1'–15') corroborates the evidence provided thus far in the study (Table 6, models 1–15). Results show: losses are positively associated with dividend changes in all models tested (models 3', 6'–9', 11', 13', 15'); earnings (losses) are positively associated with dividend changes given losses (earnings) (see models 6', 7', 11', 15'); cash flows (losses) are associated with dividend changes, given losses (cash flows) (models 8', 13', 15'); and earnings, losses and cash flows have incremental information content in explaining dividend changes (model 15'). These results are all qualitatively similar to findings presented thus far in the study.[23]

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[23] We also observe that the pseudo-R^2s are similar to those presented thus far in the study. These results are also comparable to earlier logistic regression results (DeAngelo *et al.*, 1992).

TABLE 8

LOGIT ANALYSIS OF THE DECISION TO REDUCE DIVIDENDS FOR POOLED SAMPLE OF 191 JAPANESE INDUSTRIAL FIRMS WITH AT LEAST ONE ANNUAL LOSS DURING THE PERIOD 1990–4 AND 340 INDUSTRIAL FIRMS WITH POSITIVE AND INCREASING OPERATING EARNINGS DURING THE PERIOD 1990–4

Coefficient (*p*-value)

Model	Constant	E	ΔE	Lossdum	CFO	ΔCFO	Pseudo R^2
1'	0.492 (0.000)***	8.288 (0.000)***					0.146
2'	0.945 (0.000)***		4.944 (0.000)***				0.075
3'	−0.249 (0.091)*			1.796 (0.000)***			0.129
4'	0.643 (0.000)				0.149 (0.100)*		0.010
5'	0.716 (0.000)***					0.068 (0.139)	0.010
6'	0.120 (0.501)	4.752 (0.002)***		0.904 (0.008)***			0.158
7'	−0.025 (0.892)		1.426 (0.050)**	1.538 (0.001)***			0.138
8'	−0.313 (0.044)**			1.793 (0.000)***	0.133 (0.085)*		0.134
9'	−0.244 (0.102)			1.788 (0.000)***		0.012 (0.782)	0.129
10'	0.157 (0.296)	13.175 (0.000)***	−5.331 (0.001)***				0.163
11'	−0.081 (0.661)	9.602 (0.001)***	−4.239 (0.005)***	0.707 (0.033)**			0.170
12'	0.629 (0.000)				0.176 (0.068)*	−0.255 (0.753)	0.010
13'	−0.489 (0.005)***			1.917 (0.000)***	0.342 (0.01)**	−0.215 (0.068)*	0.145
14'	0.008 (0.939)	11.491 (0.000)***	−1.091 (0.593)		0.895 (0.001)***	−0.606 (0.011)**	0.201
15'	−0.227 (0.267)	8.453 (0.001)***	−0.601 (0.762)	0.667 (0.035)**	0.848 (0.001)***	−0.599 (0.062)*	0.207

Coefficient and *p*-value: first and second line, respectively. *, **, ***, significant at the 0.10, 0.05, 0.01 level, respectively; ΔDiv = change in dividends: it is the dependent variable measured as the change in dividends per share; E = operating earnings; ΔE = change in E; CFO = cash flow from operations; ΔCFO = change in CFO; Lossdum = loss dummy. E, CFO, ΔE, ΔCFO are deflated by the market value of equity at the beginning of the fiscal year; *Z*-statistic = square root of Wald statistic = b_i/standard error of b_i.

TABLE 9

REGRESSION ANALYSIS OF THE DECISION TO REDUCE DIVIDENDS FOR POOLED SAMPLE OF 191 JAPANESE INDUSTRIAL FIRMS WITH AT LEAST ONE ANNUAL LOSS DURING THE PERIOD 1990–4 AND 338 INDUSTRIAL FIRMS WITH POSITIVE OPERATING EARNINGS DURING THE PERIOD 1990–4

Coefficient (*p*-value)

Model	Constant	E	ΔE	Lossdum	CFO	ΔCFO	R^2-adjusted
1"	−0.163 (0.000)	1.546 (0.000)***					0.342
2"	−0.005 (0.768)		1.548 (0.000)***				0.217
3"	−0.361 (0.000)***			0.379 (0.000)***			0.274
4"	−0.109 (0.000)***				−0.167 (0.604)		0.001
5"	−0.103 (0.000)***					0.042 (0.100)*	0.004
6"	−0.246 (0.000)***	1.151 (0.000)***		0.146 (0.001)***			0.359
7"	−0.239 (0.000)		0.807 (0.000)***	0.276 (0.000)***			0.312
8"	−0.372 (0.000)***			0.378 (0.000)***	0.066 (0.018)**		0.275
9"	−0.351 (0.000)***			0.76 (0.000)***		0.066 (0.003)***	0.275
10"	−0.182 (0.000)***	1.691 (0.000)***	−0.219 (0.367)				0.342
11"	−0.259 (0.000)***	1.258 (0.000)***	−0.152 (0.527)	0.144 (0.001)***			0.358
12"	−0.090 (0.000)***				−0.034 (0.439)	0.061 (0.083)*	0.010
13"	−0.358 (0.000)***			0.377 (0.000)***	−0.196 (0.601)	0.055 (0.062)*	0.275
14"	−0.177 (0.000)***	1.761 (0.000)***	−0.273 (0.264)		−0.031 (0.383)	0.086 (0.002)***	0.358
15"	−0.259 (0.000)***	1.288 (0.000)***	−0.165 (0.500)	0.148 (0.001)***	−0.002 (0.952)	0.073 (0.010)***	0.374

Coefficient, and *p*-value: first, and second line, respectively. *, **, ***, significant at the 0.10, 0.05, 0.01 level, respectively; ΔDiv = change in dividends: it is the dependent variable measured as the change in dividends per share scaled by the dividends per share at the beginning of the fiscal year; E = operating earnings; ΔE = change in E; CFO = cash flow from operations; ΔCFO = change in CFO; Lossdum = loss dummy. E, CFO, ΔE, ΔCFO are deflated by the market value of equity at the beginning of the fiscal year.

Linear Relationship Between Dividend Changes and Earnings, Losses, Cash Flows

To examine the robustness of the logistic regression results presented in Table 6, the analysis was repeated using a linear regression approach. The same sample of loss and non-loss firms was employed, but the dependent variable was redefined as continuous. Linear regression results of the association of dividend changes with earnings, losses and cash flows (Table 9) are consistent with the evidence presented thus far in the study: (a) losses are positively associated with dividend changes (3'', 6''–9'', 11'', 13'', 15''); (b) earnings (losses) have incremental information content beyond losses (earnings) in all models tested (7'', 11'', 15''); (c) cash flows (losses) have incremental information content beyond losses (cash flows) (models 8'', 13'', 15''); and (d) earnings, losses and cash flows are associated with dividend changes (model 15'').[24] In summary, comparing the regression results in Tables 6, 8 and 9 confirms that the three alternative methodologies provide qualitatively similar results.

SUMMARY AND CONCLUSIONS

This article has investigated three hypotheses related to dividend policy. Results of this study have confirmed all three hypotheses. This analysis has established that an annual loss is a necessary but not a sufficient condition for dividend reductions in firms with established earnings and dividend records (H1). About 80 per cent of the loss firms reduced or omitted dividends during their initial loss year for the period 1990–4, a rate greatly exceeding the 15.7 per cent incidence of dividend reductions in a control sample of firms with no losses during the same period. Like earlier U.S. studies, the logistic regression results indicate that firms are more likely to reduce dividends the greater their current losses. Contrary to earlier U.S. evidence, the present analysis indicates that both the level and changes in earnings have information content beyond annual losses in explaining dividend changes. Results also verified the second hypothesis, that is, that cash flows have information content beyond annual losses and earnings in explaining dividend changes, despite certain U.S. studies which found contradictory results. Finally, the third hypothesis was also confirmed, as analysis revealed that the dividend reduction and cash flow variables are significantly positively related to future earnings. These Japanese results are consistent with the existing U.S. evidence.

In summary, the findings of this study may offer insight and guidance to the Japanese standard setting body and to worldwide investors regarding the usefulness of cash flow information in dividend policy. However, the results of this study should be interpreted with caution because: (a) the dataset includes mainly large public firms listed on the major Japanese stock exchanges, and therefore results can be generalized only to those firms; and (b) the earnings and cash flow variables used can only partially explain dividend changes, primarily because there are also other financial and macroeconomic factors that could possibly explain dividend changes. In conclusion, this study encourages further research that may improve our understanding of the role of earnings, cash flows and annual losses in explaining dividend changes and future earnings. Since no other work thus far has examined the combined effect of cash flows and annual losses to explain dividend changes, the results encourage further international research in this area to strengthen our confidence in the evidence provided thus far. The present results may also be useful in evaluating empirical models on the association of dividend changes with earnings, cash flows and losses. For example, evidence confirming that the same financial variables are associated with dividend changes in different countries would strengthen the analysis provided herein, while finding that dividend changes are affected by different factors in each country would suggest even further research exploring institutional or behavioural differences among countries.

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[24] These results indicate that the variability in dividend changes explained by earnings, cash flows and losses is about 37 per cent. These results are comparable to those linear regression results provided by Charitou and Vafeas (1998). Note that the adjusted R^2 (see Table 9) is not comparable to the pseudo-R^2 (see tables 6, 8) because the adjusted R^2 was derived from regression analysis whereas the pseudo R^2 was derived from logistic regression (Dielman, 1996, p. 268).

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GEOFF BURROWS AND BARBARA SYME

Zero-Base Budgeting: Origins and Pioneers

The origins of the zero-base budgeting (ZBB) concept are traced to Bastable (1892), more than twenty years earlier than extant sources indicate. The record then shows a proliferation of ZBB thought and practice during 1902–17, encompassing a parliamentary committee, the British Treasury and a diverse group of authors. Contemporary reviews, biographies and sociological theory are then drawn on to explain why only (Edward) Hilton Young, an early member of the Bloomsbury group and sometime suitor to Virginia Stephen (Woolf), is nowadays mentioned in connection with ZBB. Tentative explanations are offered for the emergence of ZBB thinking in this pre-1920 period.

Key words: Accounting history; Biography; Zero-base budgeting

References to the history of zero-base budgeting (ZBB) are invariably vague both about the origins of this concept and the identities of its originators. Moreover, it is not always clear whether it is ZBB or a precursor notion—opposition to incremental budgeting—which is being discussed. Jones and Pendlebury (1984, p. 88) quoted a passage from Young (1915) as an early criticism 'of the problem of incremental budgeting that . . . [ZBB] attempts to solve'. Illustrating the longstanding criticisms of incremental budgeting methods, Wildavsky and Hammond (1966, pp. 323–4) used the same passage, but attributed to Young and Young (1924). Perhaps with Young in mind, Gordon and Heivlin (1978, p. 60) averred that the 'origin of ZBB has been traced back to 1924 and probably goes back much further'. Glynn (1993) merely cited Gordon and Heivlin on this issue.

The history of ZBB is even more complex than these sources indicate. Hilton Young, the author of the cited 1915 and 1924 works, is just one of several writers who can be credited with drawing attention to, rather than originating, the ZBB concept. Young (1915) was the second of a quartet of books on a common theme which appeared almost contemporaneously. The pacemaker was Higgs (1914), followed by Young (1915), Durell (1917), and Willoughby *et al.* (1917). All referred to the ZBB concept, although Young's treatment is the most memorable. However, the credit for first raising the idea arguably belongs to Bastable (1892).

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This early ZBB *oeuvre* was produced by a group of remarkable individuals who approached the topic from a variety of disciplines. The considerable biographical data available about these authors provides the opportunity to explore the importance of personal and group dynamics in the development and dissemination of ZBB thinking. This article combines biographical theory and sociological concepts with a standard literature review to: (a) clarify the origins of ZBB and its precursor concepts; (b) outline the precise contributions of each author; and (c) explain why only Young's name resonates to the present day in connection with ZBB.

ZERO-BASE BUDGETING (ZBB)

Horngren *et al.* (1996, p. 492), define ZBB as 'budgeting from the ground up, as though the budget were being prepared for the first time. Every proposed expenditure comes under review.' The modern impetus for ZBB was provided by Pyhrr (1973, p. 1), drawing on Burns' (1969) observation that

> customarily the officials in charge of an established program have to justify only the increase which they seek above last year's appropriation. In other words, what they are already spending is accepted as necessary, without examination. Substantial savings could undoubtedly be realised if every agency . . . [made] a case for its entire appropriation request each year, just as if its programme or programmes were entirely new.

By emphasizing the catchy title 'zero-base budgeting', and claiming an apparently successful implementation of this budgetary approach, Pyhrr was accorded *savant* status in relation to ZBB. However, neither title nor concept originated with him. Wildavsky and Hammond (1966, p. 321) used the term 'zero-base budget' to describe a 1962 initiative by the U.S. Department of Agriculture to replace 'traditional [incremental] methods of budgeting . . . [with] a comprehensive and simultaneous evaluation of all departmental programs'. However, it is not clear from their account whether the term 'zero-base' originated with them, the Department of Agriculture or some other source.

Pyhrr's original contribution was to propose a range of ostensibly simple cost-benefit techniques, utilizing the 'decision-package' concept, for determining the optimum level of service to be provided. However, whether ranking decision packages is a cost-effective annual-budgeting technique is questionable. Wildavsky and Hammond (1966, p. 321) recorded that this approach proved impractical in the Department of Agriculture. Anthony (1977) claimed that ZBB had never been comprehensively implemented at two entities associated with Pyhrr: Texas Instruments, Inc., and the U.S. state of Georgia. Similarly, Anthony and Reece (1989) reported that the Carter administration's initiative of using ZBB as a tool for preparing U.S. federal budgets was abandoned by the subsequent Reagan administration which found this approach cumbersome and unproductive.

In searching for the origins of ZBB it is useful to distinguish between strong and weak forms of the concept. In the strong form, the annual budgetary process starts from base zero and involves some mechanism for assessing the costs and benefits of increments in spending. The weak form involves a critical approach to earlier expenditure levels, combined with some review process. Implicitly, the literature has adopted the weak form of ZBB when referring to the origins of this concept. In the interests of continuity, we follow this practice. Because of shared conceptual underpinnings, it is also useful to extend the analysis to include Anthony and Govindarajan's (1995) notion of 'zero-base review' in which a ZBB-type approach is applied non-routinely to selected activities.

For our purposes, ZBB-concepts will be treated as appearing in writings which (a) recognize that the *status quo* should not be the starting point for the following budget; (b) advocate some review of, or justification for, existing levels of expenditure even if the mechanisms do not require total reviews (i.e., returning to base zero); and (c) apply these processes either to organizational sub-units or entire organizations.

ZBB PIONEERS

Charles F. Bastable (1855–1945)

Bastable's (1892) *Public Finance*—claimed by Smith (1945) to be the first comprehensive public finance text to appear in almost fifty years—contained two short chapters dealing with aspects of the U.K. budget. Discussing the importance of accuracy in the annual estimates, Bastable (p. 654) observed that

> one very natural course in the infancy of Finance was to take the figures of the preceding or some other year, generally the last for which the accounts are made up, as the basis. Another method nearly as mechanical is to take the increases during preceding years and count on a like result in the future. In reality, these facts should only be regarded as elements in the calculation. The revenue and expenditure of a State do not move in a definite course; they are acted on by many distinct causes, and it is on these that the financier should frame his estimates.

Key ZBB ideas—a reluctance to base estimates solely on past figures or trends and the need to look afresh at causative factors—are all evident in this passage. However, although the tone is prescriptive, there is no indication that these prescriptions were followed.

Smith (1945) outlined how the Dublin-based Bastable's longevity applied also to his academic career. As professor of political economy at Dublin University during 1882–1932, Bastable's period of chair incumbency has rarely been surpassed. However, this position was effectively part-time, causing Bastable to combine this post with other chairs in law and political economy at various times. A shy man who never married, Bastable served on the Fiscal Committee of the Irish Free State following the break with Great Britain. A prolific contributor to the early editions of the *Economic Journal*, he was also an authority on international trade.

House of Commons Select Committee on National Expenditure (1902–3)

The committee was appointed on 28 May 1902, to 'inquire whether any plan can be advantageously adopted for enabling the House, by Select Committee or otherwise, more effectively to make an examination, not involving criticisms of policy, into the details of National Expenditure'.

Driving the committee's appointment was concern about snowballing government expenditure. From £53 million in 1893–4, current outlays were expected to swell to £109 million in 1903–4, dominated by the army and navy votes (rising from £26 million to a budgeted £64 million). Total spending on education and postal services was rising at an even faster rate (from £11 million to £29 million in the same period), reflecting the financial burden of expanded government services. Reporting on 7 July 1903, the high-profile committee, which included Austen Chamberlain, Winston Churchill and Bonar Law, focused on the three levels of control operating after estimates left individual departments: the Treasury, which reviewed and coordinated estimates; the Comptroller and Auditor General charged with ensuring that actual expenditure was authorized; the House of Commons itself, particularly through its Public Accounts Committee, which could investigate management and efficiency issues.

Relevant to our ZBB focus, the committee (1903, p. iv) concurred with witnesses who 'suggested that to prevent any risk of obsolete expenditure the Treasury should at fixed periods (perhaps once in five years) exercise the right they already possess to overhaul and systematically revise the staff of the various Department'. In this suggestion, the solution to the problem of obsolete expenditure—a fundamental review of departmental staffing (in a labour-intensive setting)—embodies a ZBB-review concept. There are no reports of this recommendation being formalized in Treasury reviews, but Young (1915) suggested that the Treasury was quite activist in relation to departmental estimates.

Henry Higgs (1864–1940)

Higgs (1914, p. 1) opened his *Financial System of the United Kingdom* with a discussion of the preparation of the estimates, *inter alia* mentioning a Treasury circular which initiated this process. The full text of the circular, dated 2 October 1911, for the 1912–13 financial year, was included as Appendix III. Headed 'explanation of estimates', the key section read as follows:

> My [Treasury] Lords desire to impress upon Departments the fact that a sufficient explanation is necessary for a duly authorised service even when it does not exceed the estimate of the preceding year. *The habit of regarding each year's estimate as the starting-point for the next is one against which special vigilance is needed in the case of services upon which the expenditure is in some degree discretionary*, and My Lords think it necessary to warn Departments, especially those whose expenditure is of this character, that they must be prepared to subordinate such expenditure to the financial exigencies of each year. (emphasis added)

The context in which Higgs cited this document is significant in relation to the historical record. It appears that he simply included the most recent version of the Treasury circular in his manuscript. The timing—an October 1911 circular relating to the 1912–13 financial year—fits with the publication of Higgs' opus in 1914. The proposition that the circular was merely *recent* rather than *novel* means that documents of this type could well pre-date 1911. Its genesis could have been the 1902–3 select committee's concern with the possibility of obsolete expenditure.

Constrained by his Treasury position, Higgs (1914) avoided critical comments on efficiency and policy matters. Focusing on current revenues and expenditures, he ignored issues associated with public debt and financial markets, particularly the links between the government, the Bank of England and the City. A substantial part of his work consisted of appendixes, including the 'explanation of estimates' on which there was no textual comment.

A founding member of the Royal Economic Society, Higgs was accorded two obituary notes in its *Economic Journal* which he co-edited during 1892–1906. In the first obituary, Collet (1940) recorded that Higgs was the eleventh of thirteen children of a Cornish squire. Joining the civil service aged seventeen as a boy clerk, Higgs passed the competitive examination for a Class 1 position three years later. Studying law part time, he graduated LLB in 1890. *En route* he was inspired by Herbert Foxwell's lectures on political economy, particularly by references to eighteenth-century Irish–French economist–entrepreneur, Richard Cantillon. Ultimately, Higgs became a historian of economic thought and an authority on Cantillon and his fellow 'physiocrats'.

Within the civil service, Higgs progressed into a semi-permanent ministerial private secretary, serving, *inter alia*, Austen Chamberlain (when financial secretary to the Treasury then postmaster-general) and Henry Campbell-Bannerman (when prime minister). He also had special assignments as commissioner to Natal (1902–3) and inspector-general of finance in Egypt (1912–15). 'On call' whenever parliament was sitting, Higgs could take extended furloughs when the house rose, allowing him to indulge his historical interests and spend long periods in France. Marrying when he was forty-four, he stood unsuccessfully as a Liberal at the 1922 general election, a year after he retired as principal clerk of the Treasury.

Accompanying Collet's obituary was an affectionate reminiscence by Keynes himself, who had seen the 'clubbable' middle-aged Higgs evolve into an elderly stone-deaf eccentric who would attend council meetings of the Economic Society and talk, uninvited, on items utterly irrelevant to the agenda. Keynes (1940, p. 557) recollected that the only chairman who could silence Higgs was Edwin Cannan, and then only by taking Higgs 'almost by the throat, shouting down his ear that we were not discussing that matter, and putting his hand over his mouth until he gave up'.

Hilton Young (First Baron Kennet, 1879–1960)[1]

In the first edition of his *System of National Finance*, Young (1915, pp. 28–9) described the preparation of the estimates in which

> The Treasury, the co-ordinating department . . . sends a circular letter to the officers responsible for the preparation of the estimates in each civil [non-army or navy] department, requesting them to prepare estimates of the expenses of the departments in the coming year. There are two stereotyped admonitions in this circular; one is general, that the state of the public revenue demands the utmost economy; the other is a particular warning against assuming last year's estimates as the starting point for those of the next. The latter

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[1] Unless otherwise indicated, this biographical material is synthesised from E. H. Young (1959) and W. Young (1971).

> is a necessary warning. It must always be a temptation to one drawing up an estimate to save himself trouble by taking last year's estimate for granted, adding something to any item for which an increased expenditure is foreseen. Nothing could be easier, or more wasteful and extravagant. It is in that way that obsolete expenditure is enabled to make its appearance year after year in the estimates, long after all reason for it has ceased to be. By this warning and by the general admonition as to the need for economy the departments are no doubt duly impressed.

Several aspects of this still-cited passage are noteworthy. First, it describes actual British Civil Service practice rather than an original idea of the author's. Second, the missive to which it refers is obviously the circular comprising Appendix III to Higgs (1914). Third, the tone suggests that the ZBB-type admonition was not recent. Fourth, the practice described does not literally embody the zero-base concept, although this is but an extension of the key point that budgets should not start with the *status quo*. Fifth, the ironical finale indicates that this concept may not have been applied altogether rigorously. Overall, the paragraph is both stylish and informative, outlining the strength of the ZBB idea while acknowledging implementational difficulties. This passage is typical of Young's tone and approach. Seldom has such a gifted writer tackled such an unglamorous topic.

The third son of a baronet, Edward Hilton Young was born into a family prominent in the navy and administration. Through his great-grandmother, formerly Emily Baring, he was related to one of the great merchant-banking dynasties. His father, Sir George Young, a classicist and charity commissioner, was a friend of Sir Leslie Stephen, father of Thoby, Vanessa (later Bell), Virginia (later Woolf) and Adrian. The families' children frequently played together. Educated at Eton and Trinity College, Cambridge, Young graduated in 1900 with first-class honours in science and a *curriculum vitae* that included editorship of the *Cambridge Review*, presidency of the union and close friendships with G. M. Trevelyan and E. M. Forster. Participating in the early gatherings of the Bloomsbury group, his marriage proposal to Virginia Stephen in May 1909, made on a punt at Cambridge, was rejected with the excuse that 'she could marry no one but Lytton [Strachey]' (Bell, 1976, p. 144).

Although he was called to the Bar in 1904, Young's legal career did not take. Switching to financial journalism, he was assistant editor of *The Economist* in 1908, then city editor of the *Morning Post* in 1910. Enlisting in the navy in August 1914, he saw action in some unusual land-based theatres, including Serbia (Danube blockade), Flanders (naval siege guns) and Russia (commanding an armoured train). Reaching the rank of lieutenant commander, he won the DSC and bar, DSO, Croix de Guerre and Serbian Silver Medal, but lost his right arm in the raid on Zeebrugge. Notwithstanding his own combatant role, Young supported his anti-war Bloomsbury friends, attesting to Clive Bell's (1916) pacifist beliefs and letting his holiday cottage, the Lacket, to Lytton Strachey who started *Eminent Victorians* there.

In April 1915, as a Liberal, and while on active service, he was elected unopposed to the House of Commons at a by-election. Shortly afterwards his *System of National Finance* appeared. Many reviewers emphasized that the author was now an MP. In the preface, dated January 1915, Young described the work as a

> primer of the system on which the financial business of the nation is conducted at the present time. It is intended as a first aid to those who need to understand something about the manner in which the nation gets and spends its revenue, borrows money, and keeps its accounts.

In Lloyd George's coalition government during 1921–2, Young replaced Stanley Baldwin as financial secretary to the Treasury, effectively the minister assisting the Chancellor of the Exchequer. In this capacity he liaised with the Committee on National Expenditure (Geddes Committee) a group of prominent businessmen charged with recommending 'all possible reductions in the National Expenditure on Supply Services' (Shirras, 1924, p. 29). An early public-sector 'razor gang', the committee proposed annual expenditure reductions of £86 million, including lopping £41 million from the army and navy votes. For their pains, the committee was accused by the Admiralty of 'gross negligence and abject ignorance' (Hirst and Allen, 1926, p. 378).[2]

In March 1922 Young married Kathleen Lady Scott. An eminent sculptor, she was the widow of Antarctic explorer, Robert Falcon Scott, and friend and confidante of H. H. Asquith, J. M. Barrie, George Bernard Shaw, Fridtjof Nansen and Isadora Duncan. In August the following year, when Kathleen was forty-five and Young forty-four, they had a son, Wayland. In 1927 they paid £5,000 for a fifty-year lease of Leinster Corner, opposite Kensington Gardens. A previous occupant, J. M. Barrie, had written *Peter Pan* there, modelling the fictional Darlings' house on Leinster Corner (Young, 1995, p. 218).

Losing office in 1922 and his parliamentary seat for ten months during the political turmoil of 1923–4, Young updated *The System*, drawing on his ministerial experience in a financial portfolio. For this edition he had a co-author, his cousin N. E. Young.[3] The only significant addition to the section of the book dealing with revenue and expenditure was a description of a program-budgeting initiative by the army (Young and Young, 1924, p. 38). However, the coverage of public debt had been extensively revised to encompass new debt instruments issued to finance World War I. Hitherto, most government debt had been funded through consols (permanent annuities). During the war a variety of shorter term instruments evolved. 'Contingent' liabilities had greatly increased due, *inter alia*, to export credits granted under the *Overseas Trade (Credits and Insurance) Act, 1920* and a League of Nations loan to Austria, partly guaranteed by Britain.

Re-elected in 1924, Young remained in opposition throughout the rest of the 1920s. Knighted in 1927, he was a member of committees or commissions which investigated a range of public finance and administrative issues. Adviser to the Polish government on stabilizing the nation's currency in 1923–4, he chaired the Royal Commission on Indian Currency in 1926 and was a delegate to the League of Nations during 1926–8 and again in 1932.

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[2] Boyce's (1987, p. 46) account of the creation of the Committee on National Expenditure (Geddes Committee), suggests that the impetus came from within the ruling Liberal Party rather than parliament itself.

[3] Norman Egerton Young, MC (1892–1964), was British Government Director of the Suez Canal Company during 1939–45. He drowned in a sailing mishap off Mozambique.

In the 'national' government during 1931–5 he was minister for health, a portfolio which also embraced housing, water supply and pensions. In this capacity he was publicly criticized by his friend Keynes (1933) for deferring *public* housing works, thereby exacerbating unemployment in the building trades. In hindsight, Keynes' attack was misguided, reflecting the lag between economic activity and the ensuing statistics. Richardson (1967, pp. 154–5) described a 'housing boom', occurring in 1933–7, due more to private-sector than local-authority house building. Young (1938) subsequently pointed to a progressive increase in *private* house completions from 60,044 in the six months to September 1931, to 149,085 for the six months to March 1935.

Following Ramsay McDonald's resignation in June 1935, Young was elevated to the peerage as Baron Kennet of the Dene. The third and last edition of the *System* appeared the following year. The section on government debt had been reduced to its bare essentials, while Britain's abandonment of the gold standard in 1931 inspired a new section dealing with the exchange equalization account. Legislative changes affecting local authorities necessitated alterations to the coverage of local-government grants. The demise of the army's program-budgeting experiment was recorded.

Capitalizing on his financial expertise, political reputation and city links, by 1940 he was chairman of three companies and on the boards of seven others in the finance, property, building and transport industries. He was also a member of the 'lifeboat crew', an informal group of senior businessmen led by chartered accountant Sir Archibald Jamieson, chairman of Vickers Armstrong, who acted as what would nowadays be called 'company doctors' (Young, 1997). During 1937–59 he chaired the Capital Issues Committee (CIC) (Young, 1959, p. 78), which advised the Chancellor of the Exchequer 'on applications to issue capital for any purpose anywhere'. In World War II, issues of shares and securities exceeding £10,000 had to be approved by the CIC. In 1946 this limit was raised to £50,000 (Pollard, 1969, pp. 328, 372). As chairman, Young was literally and metaphorically (over)lord of the new issues market. From a modern perspective, the prolonged, regulatory role of the CIC under, variously, Conservative, Coalition and Labour administrations was an extraordinary phase in the history of the U.K. capital market.

In 1959, Sir Samuel Brittain's *The British Budgetary System* appeared, which the former Treasury mandarin saw as a replacement for Young's *System of National Finance*, which had been 'useful to legislators, administrators, students and the general public' for over forty years. Brittain (1959, p. 7) confessed to being unable to emulate 'Lord Kennet's detachment; and . . . the easy grace of his exposition'.

A. J. V. Durell (1871–1945)

Higgs' and Young's works were joined in 1917 by Colonel A. J. V. Durell's *The Principles and Practice of the System of Control Over Parliamentary Grants*. Durell (1917, p. x) acknowledged the comprehensive efforts of Higgs and Young, compared with which his own *opus* was narrower and more detailed. In the foreword, Sir Charles Harris, the War Office's financial chieftain, described Durell's book as 'admirably adapted to the needs of the financial official, of whatever grade, who aspires to be more than a lifeless cog in the vast machine of our administration'.

Despite frequent references to the history of budgetary practices, Durell shed no more light on the origins of the budget-initiating Treasury circular. However, Durell (1917, p. 253) did allude to the ZBB concept and contrast it with conventional practice when he observed that

> The justification for asking for the same amount for a service as was granted in the preceding year is to be found in the conditions remaining the same, both as regards continuance of policy and methods of administration. Evidence of this must be forthcoming if required by the Treasury. In practice, however, the automatic or standing estimates are usually prepared on the average of three years' expenditure.

When discussing sources of expenditure likely to become obsolete, Durell (1917, p. 262) described an early version of what Anthony and Govindarajan (1995, pp. 336–7) labelled a zero-base review:

> In estimates the *status quo* is not the measure of justifiability, Treasury criticism is frequently and effectively directed to the discontinuance of such items, by securing periodical reviews of their continued necessity after a change of policy or in altered circumstances. The Treasury in observing such items, would call upon the department from time to time to show cause for the work that is done; but it is obviously the duty of the department and of local authorities to be ever on the watch to check such expenditure whenever possible and not to wait for Treasury intervention.

Durell's entry in *Who Was Who* (1961) indicates that he was a prize-winning RMC Sandhurst graduate who joined the army's pay corps. Mentioned in dispatches during the Boer War, he became chief paymaster at the War Office, retiring in 1918 to commence a second career as bursar at the Leys School, Cambridge.

William F. Willoughby, Westel W. Willoughby and Samuel M. Lindsay

Reflecting U.S. interest in European approaches to governmental financial administration, Willoughby *et al.* (1917) was initiated in 1914 as part of a larger comparative study embracing Britain, France and Germany. The project was overtaken by World War I and, ultimately, dealt only with the U.K. Willoughby *et al.* referred several times to Higgs (1914) but more frequently to Young (1915), whose work was described as 'a popular treatment by a member of the British Parliament . . . [which] gives added value to the more technical discussion of this [Willoughby *et al.*] report'.

In describing the preparation of the British estimates, Willoughby *et al.* (1917, p. 54) quoted verbatim the 1911 Treasury letter cited in Higgs (1914). Referring to the ZBB-type admonition, Willoughby *et al.* (pp. 64–5) remarked that

> it is one thing to keep down additional expenses and quite another to effect reductions in authorized expenditures in the past which are in excess of present real needs. The requirement quoted, in addition to being a general appeal for economy, has for its purpose the laying of the basis for the Treasury questioning any item, whether or not it exceeds the provision for the current year.

Of the joint authors, Professor Westel W. Willoughby (1867–1945) was probably the best known. According to Hatcher (1973) he was originally a lawyer who joined the department of Political Science at Johns Hopkins University in 1895, remaining there until 1933. One of the founders of the discipline of political science in the U.S., he was the inaugural editor (1906–16) of the *American Political Science Review*. His scholarship extended to the Far East and he advised the Chinese government at several international conferences during 1917–30 on controlling, variously, armaments and drug trafficking. His namesake co-author and identical twin brother, William, held the chair of Jurisprudence and Politics at Princeton University. The third author, Samuel Lindsay, was Professor of Social Legislation at Columbia University.

ZBB CHRONOLOGY AND EXPLANATION FOR YOUNG'S DOMINANCE

From the foregoing literature review, the following chronology of ZBB thinking can be constructed:

- Bastable (1892) cautioned that estimates for expenditure should be framed on the basis of causation rather than on previous years' figures or trends.
- The Select Committee on National Expenditure in July 1903 endorsed regular reviews of departmental staffing to overcome the problem of 'obsolete' expenditure.
- The admonition that each year's estimate should not be regarded as the starting point for the following year's budget can be dated to October 1911 in British Treasury documents and may have commenced even earlier.
- The first general reference to this Treasury practice appeared in Higgs (1914), albeit in the obscurity of an appendix and without textual comment.
- Young (1915) first drew attention to the Treasury ZBB admonition, its rationale and operational implications.
- Durell (1917) described a zero-base-review-type process.
- Willoughby *et al.* (1917) contained probably the first U.S. reference to the ZBB concept.

Most of these references to ZBB or precursor concepts occur in comprehensive works on government accounting or public finance. Therefore, to explain why only Young (1915) enjoys modern recognition in connection with ZBB we must compare the virtues of his opus relative to those of his rivals. Contemporary reviews provide a useful guide for this purpose.

J. M. Keynes had a longstanding acquaintance with Higgs, through the Economic Society, and even stronger links with the Young family.[4] It is not, therefore, surprising that as editor of the *Economic Journal*, Keynes should select Bastable—the great figure in public finance—to undertake a major review of the Higgs–Young works. Bastable's (1917, pp. 72–3) subsequent insights are instructive. While he praised Higgs for 'furnishing the clearest and most concise account of the *formal* side of the British system' (emphasis added), he also noted the dryness of this approach, partly due to the veneration accorded Treasury minutes. In contrast, Young, whom he lauded for the quality of his writing, lightness of tone and comprehensive treatment, 'is not in the least afraid of popular language. Nor is he overawed by the dignity even of the Committee of Public Accounts.' Ultimately, Bastable declared that the 'ordinary citizen who is curious about matters of State finance will prefer to learn from Mr Young'.

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[4] Skidelsky (1983) records several associations between Keynes and the wider Young family: one of Keynes' teachers at Eton was Geoffrey W. Young, Hilton's next brother and a famous mountaineer; a close school friend of the economist was Young's cousin, Gerard Mackworth Young (Norman E. Young's oldest brother); when Keynes came down from Cambridge, he contemplated sharing a house in London with Hilton Young and an older Cambridge group.

Similarly, when Durell (1917) and Willoughy *et al.* (1917) were published, it was no surprise that the *Economic Journal*'s reviewer was Henry Higgs. Contesting the publisher's claim that Willoughby *et al.* (1917) was the 'first authoritative' account of the British financial system, Higgs (1917, pp. 524–6) pointed out that in some respects it covered 'less ground' than the earlier works of Young and himself. However, he acknowledged that it provided 'a good account, and should well serve its purpose with the American public'. In contrast, he criticized Durell for indiscriminately amalgamating countless extracts from official sources and earlier works, wishing that the 'author had cut himself loose from his material, made a bonfire of his authorities and given us . . . a history of the subject, culminating in a description and a criticism of the system'.

Bastable's comment about the irreverence of Young's approach is pertinent to the reputational issue. Of the three English writers, Young was the only non civil servant and he used his outsider's freedom to be sceptical about the *status quo*. But information gathering had to precede scepticism. Social theorists such as Mills (1956) and Useem (1984) demonstrate how 'power elites' and 'inner circles' favour their own kind. Sampson (1971) depicts a related phenomenon among the British intellectual and administrative 'aristocracies'. These social-networking concepts in relation to the milieu in which Young moved are vividly captured in Leonard Woolf's (1964, p. 75) observation that his 'establishment' Bloomsbury friends

> had an intricate tangle of ancient roots and tendrils stretching far and wide through the upper middle classes, the county families and the aristocracy . . . Socially they assumed things unconsciously which I could never assume . . . They lived in a peculiar atmosphere of influence, manners, respectability, and it was so natural to them that they were unaware of it.[5]

In his preface, Young (1915) thanked eight senior civil servants from a range of departments 'for explanations most kindly and helpfully given', disingenuously adding that these 'explanations . . . would, no doubt, have been equally at the disposal of anybody else . . . concerned to enquire into these matters'. Doubtless, explanations of some kind would have been at the *disposal* of *anybody* who enquired. Whether they would have been *equally* so is less certain. It surely helped that Young was from a titled family and that his father had been a distinguished charity commissioner. Moreover, Young had links of the type identified by Woolf with at least two of his informants: C. L. Davies, assistant paymaster general, and V. W. Baddeley, assistant secretary to the Admiralty for financial duties. Charles Llewellen Davies was a brother of Theodore Llewellen Davies, an early participant in the Bloomsbury group; Vincent Baddeley in 1903 had toured in Turkey with Young.[6]

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[5] Woolf, who considered himself an outsider in this setting, recorded that his family had only recently made the transition from the ranks of Jewish shopkeepers (his grandfather) to the professional classes (his father, a barrister).

Young's dominance over his rivals is indicated in Craig's (1925) review of the second edition of *The System* in which he observed that, since its publication, the first edition 'has become a standard work'. This second edition he described as a 'clear and comprehensive account of our national financial system . . . recommended to anyone . . . who is interested in knowing how the system works'.

In short, what Blaug (1994), following Jaffe (1974), called the 'context of discovery'—the circumstances in which ideas are developed and the particular forms they take—has considerable explanatory power in relation to the achievements of these authors.[7] Young approached government accounting from a background in financial journalism with its investigative ethos and emphasis on broader financial markets. From outside the system he could afford to be critical. In a stratified society, his social pedigree provided the connections which facilitated his data gathering. In contrast, both Higgs and Durell faced the constraint of writing from within the system they were describing. Further, their social status was inferior to Young's. Nevertheless, Young still had to capitalize on his advantages and this he did in a highly readable and insightful way.

Another concept of Blaug (1994), the context of dissemination, is apposite to the subsequent reception of Young (1915, *et seq.*).[8] Here, the relevant factors are Young's financial journalism and status as an MP. His Fleet Street experience may have done more than hone his writing skills. It can be conjectured that journalistic networking assisted his book's reception through reviews in major national and provincial newspapers. His parliamentary status further enhanced his authority, as did his ministerial experience with later editions. With variations, some of Blaug's (1994) explanations for the rapid promulgation of Keynes' theories—wide social contacts, financial journalism and the prestige of his (Cambridge) position—also apply to Young.

A footnote to this reputational issue is the neglect by U.S. authorities of the ZBB contributions of the home-grown Willoughby *et al.* (1917). Wartime exigencies may have prevented any U.S. distribution of Young (1915) but it is curious that American authorities invariably cite Young and Young (1924) rather than Willoughby *et al.* (1917) as the first ZBB work. The probable explanation is that in the early 1930s the 1924 edition of the *System* caught the eye of Professor A. E. Buck at Columbia University. In his comparative study of governmental budgeting,

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[6] Young (1943) refers to a trip to Turkey which the pair had undertaken many years earlier. This would appear to relate to a visit made in 1903, the subject of contemporary newspaper articles by Young.

[7] We acknowledge here the debate among economists about the relevance of biography and Stigler's (1982) 'personalities are irrelevant' stance in opposition to Jaffe. See Blaug (1994).

[8] Blaug did not actually use this term, but the expression seems to capture the essence of his discussion about why Keynes was able to promulgate his ideas so quickly.

Buck (1934) drew extensively on Young's (1924) description of British budgetary processes, quoting the seminal ZBB passage. In his bibliography, Buck noted that Young and Young (1924) was the second edition of a work first published in 1915. Buck also referred to Willoughby *et al.* (1917) but only in connection with U.S. financial practices. Subsequent writers, such as Wildavsky and Hammond (1966), Gordon and Heivlin (1978) and Glynn (1993), who have drawn either directly or indirectly on Buck, have used the 1924 date and overlooked the qualification relating to 1915.

EMERGENCE OF ZBB THINKING PRE-1920

An intriguing question arising from this chronology is why a cluster of works about government accounting should have appeared during 1914–17. The superficially obvious explanation of World War I financial problems is unconvincing. Higgs' opus was published late in 1914. Effectively it must have been completed before the war commenced. Young was on active service from 22 August 1914, suggesting that his manuscript was largely completed prewar. Similarly, while Durell (1917) was published in the third year of hostilities, the author's War Office responsibilities must have constrained large-scale writing. It can be surmised that his book too was written mostly prewar.

It can be conjectured that two pre-war phenomena stimulated all these publications: the absence of a comprehensive coverage of Westminster's financial systems, and an increased focus on governmental financial systems arising from the increased role of government in the economy. Support can be adduced for both explanations. The prefaces/forewords to Higgs (1914), Young (1915) and Durell (1917) all refer to the lack of any extant coverage of Westminster's financial systems and controls. That these authors were, respectively, a Treasury bureaucrat-cum-economist, a financial journalist and an army paymaster is indicative both of broad interest in these issues and a common cause.

The 1902–3 parliamentary select committee was clearly a response to budgetary pressures caused by proliferating outlays due to, *inter alia*, the expanded provision of educational and postal services. The introduction of old-age pensions in 1908 continued this process. The accompanying strains caused intense political wrangling in the U.K., culminating in the House of Lords rejecting Lloyd George's 'peoples' budget' of 1909–10 in which 'an extra £4 million [was sought] . . . to pay for old-age pensions as well as . . . seven new Dreadnoughts [battleships]' (Churchill, 1991, p. 328). Mallet's (1913) analysis of pre-World War I budgets shows expenditure increasing from approximately £142 million in 1906–7 to £181 million in 1911–12, largely due to rises in the civil service and navy (for Dreadnoughts) votes. In the U.S., similar burgeoning federal government responsibilities, and the search for overseas financial-management models, were the genesis of Willoughby *et al.* (1917). The latter's authors were from yet another discipline, political science.

In summary, the pre-1914 period saw a significant increase in the role and responsibilities of governments in advanced nations. Existing textbooks provided inadequate advice about how the associated demands on public purses should be managed. In this environment, a cluster of works emerged. Bastable (1892), who wrote ahead of this development, deserves the highest praise for anticipating the problem of entrenched spending and the need for some preventative mechanism.

CONCLUSION AND FURTHER RESEARCH

That Young is the only writer still remembered from this pre-1920 era reflects the literary qualities, breadth and approach of his work. Contemporary reviews indicate that his efforts found favour with the experts. That his book was also preferred by the wider market is evident from the presence of two later editions. However, although his pre-eminence is warranted, it is unfortunate that his contemporaries are now totally overlooked. Higgs was unlucky in that his worthy opus was overshadowed almost immediately by Young's outstanding work. In other circumstances, Higgs (1914) would have been more enduring. Even the pedestrian Durell (1917) should be credited for drawing attention to the Treasury's criticisms of estimates and querying of departmental spending plans. Finally, Willoughby *et al.* (1917) surely deserve to be recognized by their compatriots for being, on current evidence, the first Americans to refer to ZBB.

Inevitably, this chronology and the accompanying biographical notes raise a series of questions. Was Bastable's (1892) the first reference to a ZBB or precursor concept? Are there any examples of the U.K. Treasury undertaking major departmental reviews as envisaged by the 1902–3 select committee? Was the 1911 Treasury ZBB-type admonition the first, or (as seems possible) just one in a series? Did British public-sector financial practices lag or lead those of European countries, particularly in relation to expenditure reviews?[9]

Apart from these questions, Young and his work also deserve reappraising. While his insights into zero-base and program budgeting were not original, he had a rare talent both for recognizing new developments in financial management and sensing implementation difficulties. He represents at least two intellectual traditions. Self-taught in public finance and government accounting, he fits Skidelsky's (1983, p. 206) observation made in relation to Keynes, that 'like most economists at the time . . . [he had not] taken a university degree in the subject'. Young also belongs to a peculiarly European tradition, identified by Frey and Eichenberger (1993), of economists engaging in public life. Modern examples of this phenomenon are Harold Wilson, Raymond Barre, Ludwig Erhart, Andreas Papandreou and Anthony Crosland.

The Cinderella status of government accounting and its location at the interface between accounting and public finance probably explains the neglect of the achievements of Young and his fellow scribes. Despite the impressive list of accountants' biographies provided by Previts *et al.* (1990), and more recent work on individual accountants by, for example, Goldberg *et al.* (1994), Hoskins (1994), and Scorgie and Joiner (1995), the generally low profile of biography as an accounting-research

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[9] Harris' (1911) praise of the 'purposive' (program) budgeting methods adopted by the German army suggests more sophisticated practices by at least one European nation.

genre suggests, unfairly, that accounting and cognate disciplines lack interesting and important characters. It is hoped that these biographical notes on ZBB pioneers help to counter this misleading impression.

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The Accounting Foundation within The University of Sydney

Monograph No. 9, January 2000

Corporate Executives' Experiences of Continuous Disclosure

Hamish Corlett, Raymond da Silva Rosa and Terry Walter

Five years have elapsed since statutory civil and criminal sanctions were introduced via the Continuous Disclosure Regime (CDR) in September 1994 in Australia. However, the impact of the CDR on disclosure in Australia remains relatively unknown. This monograph provides an examination of the effectiveness of the CDR in achieving a more informed market. While the CDR requirements apply to both ASX listed and unlisted companies, the focus is on the impact of the CDR on ASX listed companies. Two main research questions underpin the investigation that forms the basis of this monograph. Firstly, what impact has the CDR had on the decision by a sample of ninety-three ASX listed companies to voluntarily disclose and disseminate information to the market? Secondly, how has the CDR affected the *disclosure policies* of these companies?

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EDITORIAL

Raymond John Chambers was one of the accounting giants of the twentieth century. It was due largely to his efforts that the study and teaching of accounting in Australia and beyond was able to take its rightful place as a university discipline alongside other fields of endeavour such as medicine, science, arts, engineering and the law.

Feelings of sadness and joy accompanied the preparation of this chronicle of Chambers' remarkable achievements. As the current editor of *Abacus*, and for more personal reasons, I shall miss him dearly. More than a mentor, Ray was a colleague of twenty-five years standing whom I came to admire greatly. It is thus a tremendous honour to be associated with the *Festschrift*, in setting the themes, seeking contributions, assembling material and editing this memorial to the founding editor of *Abacus*.

Ray Chambers, the son of a Yorkshire (and later Newcastle, Australia) coalminer, was born in Newcastle on 16 November 1917. Educated at Newcastle Boys High School, he matriculated in 1934 and was awarded a University of Sydney exhibition scholarship to commence part-time studies in economics. He graduated with a Bachelor of Economics in 1939 and quickly established himself in his chosen profession. Ray Chambers died on 13 September 1999 due to complications resulting from a tragic fall.

Following Chambers' death, an editorial in *Abacus* noted his lifelong conviction 'to the radical reform of accounting, the missionary zeal employed in his writings, and talks to rid the professional accounting standards and the related teaching of the many infelicities that he had exposed in his treasury of writings over the years'. Yet the nature and extent of his interests make it difficult to analyse Ray Chambers in conventional terms. In trying to establish the serviceability of accounting practice and thought his enquiries often led him into seemingly unrelated fields such as psychology, sociology, metrology and the ethics of accounting. Accordingly, this *Festschrift* is both conventional and unconventional. It endeavours to reflect Chambers' struggle with conventional accounting and its apparent failure to address a wider framework of reference. It addresses the unconventional contributions of an unconventional scholar who was no stranger to controversy.

As the many entries in his 'Aide-Memoire' attest, it is not the first time that Ray Chambers has been honoured for his contribution to accounting thought and practice; these honours include a special edition of *Abacus*, commissioned to mark his official retirement from the University of Sydney in 1982. Among the many contributors were leading Australian and overseas academics including William Paton, Maurice Moonitz, Arthur Thomas, Tom Lee, Stephen Zeff, Norton Bedford, Robert Parker, Murray Wells, Russell Mathews, Allan Barton, Ronald Ma and Ron Brown. Thus, as a tribute this latest celebration of his work and person stands alongside many other past, current and proposed projects honouring Ray's many accomplishments in promoting the discipline of accounting.

Chambers was an inspiration to students, staff and those who read his works, or heard him speak either when delivering lectures or on other occasions. This *Festschrift* provides an opportunity for some of his collaborators—PhD students and 'Sydney School' colleagues—to comment on their teacher. Clearly, these contributions can only touch on the extent of Chambers the person and his extensive life's adventure, which he described as an 'accounting odyssey', or a 'life on the fringe'. Chambers provides some personal insights into his private aims and frustrations in previously unpublished pieces which are reproduced here. Consider the following handwritten card notes he prepared for his 1992 lecture to the Probus Club 'Life on the Fringe—an Accounting Odyssey':

> Homer's tale of the adventures of Ulysses has left a legacy of allusions, figures of speech, used today by people who've never heard of Homer—the wooden horse, the lotus eaters, the cyclops, the sirens, scylla and charybdis—a mixture of successes and difficulties. It may seem arrogant of me to use the odyssey as a title for a modern time lacking the trappings of the myths. But I'd [have] liked to be an engineer, an architect, a medico. But they involved years of unpaid study, and my father, a small sole trader, had lost all he had in the depression. But I could study economics and accounting at the university at night if I left home and earned my keep during the day. So I did. Over some 14 years of academic and professional studies and a variety of junior posts in government and business [1933–47] I learned two things: (i) Accounting universally claimed to be related to the growth of business and finance; (ii) Its rules and products were not the outcome of disciplined reasoning—as in maths and physical and biological sciences—but of traditional rules of thumb and the dogma of its elders—primarily based on initial cost.

We find further candid insights on his life's journey on the 'fringe', as well as his modesty, in the text of that Probus lecture:

> Living on the fringe is always demanding, sometimes exhilarating, always adventurous. Top line persons in the arts, in sport, in science and business all live on the fringe. Some get their kicks out of doing what's not been done before, some from outdoing rivals, some from public applause—some from simply pursuing goals of their choice which others have held to be unattainable. I've had my satisfactions and of all of these in modest measure.

More than fifteen years ago, Dyckman and Zeff (1984) touched on this fringe aspect when they outlined the circumstances leading to the establishment of *Abacus* and another leading international accounting journal, the *Journal of Accounting Research*. New insights into that saga are contained in the contribution of Murray Wells, the second full editor of *Abacus*, who held the position from 1975 to 1994. Wells articulates some of the frustrations Chambers experienced in attempting to establish *Abacus*. Among other sources he draws upon Chambers' personal correspondence files that have become available following his death. He observes that the path to founding *Abacus* was akin to the rest of Chambers' odyssey—full of frustrations in the form of hurdles and setbacks which would have been too much for most. But, characteristically, Chambers persisted. Wells notes that Chambers hoped that: 'Abacus might attract articles . . . exploratory, theoretical, empirical, analytical, historical, biographical, bibliographical and so on; articles which could be longer, if necessary, than most professional journals tolerate; and articles on legal, organizational, financial and other aspects of business besides accounting' (*AAUTA News Bulletin*, 1969).

Wells' contribution notes that when *Abacus* was launched in 1965 there were only two other research oriented international academic accounting journals, *The Accounting Review* and the *Journal of Accounting Research*. Under Chambers' continued guidance *Abacus* remains highly respected thirty-six years on. It is well subscribed in around forty countries and receives international accolades for publishing papers of originality. The Anbar 1999 Golden Page Award for Originality was repeated in 2000 (see the award logo in this editorial). The ongoing success of *Abacus* is a major achievement, attributable in large part to Chambers' vision and expertise in perceiving the need to push the boundaries of accounting research by dedicating the journal to publish 'exploratory, constructive and critical articles on all aspects of accounting and on the phases of the theory and administration of organizations and of economic behaviour generally which are related to accounting, finance and business studies'.

Early in his career, Chambers perceived accounting as a practical art, necessitating that it be more than simply the product of commercial exigencies. He rejected the glib assumptions that the existence of a practice was sufficient to justify its continued use, or to provide a satisfactory basis for deriving general rules in regard to other related practices. Central to his work was the belief that accounting rested on scientific underpinnings. Thus, describing him as 'a man of science, a Renaissance man' captures the essence and the magnitude of his myriad contributions to accounting thought and practice. Wells notes: 'Chambers was ahead of his time in aspiring to meet the standards of the scientific community'. He uses Chambers' own words to support this point: 'The normal practice of science concerns itself with details, with fitting them to prevailing or proposed outlines of knowledge, with testing those outlines by reference to the details of the observable chemical, physical or biological events' (*AAUTA News Bulletin*, 1969). In a letter to the Foundation Professor of Accounting and Head of the Department of Economics and Commerce at the University of Melbourne, Sir Alexander Fitzgerald (13 May 1955), Chambers expressed the importance to a researcher of the interplay of 'thinking' about 'practice' and having a conceptualized 'ideal' to which practice should move:

> Research means broadly an examination of the scope and the content of knowledge. It includes an examination of the methods of acquiring knowledge. Knowledge in turn may be regarded as an orderly arrangement of facts and/or concepts . . . Thinking is as much a part of the process as accumulating facts. It is perhaps the most difficult part, because at the beginning it is necessary to determine what facts are relevant, and this requires that no relevant facts shall be overlooked; and later in the process there are so many things that can go wrong in the ordering of the facts and the making of inferences that great care is needed to avoid erroneous conclusions. This, it seems to me, has always been one of the points at which accountants fail. So much argument is poorly conceived and pursued without sufficient rigour . . . The problems of accounting all seem to be practical problems. But this does not mean that the process of thinking about them need always be limited to what is practicable. There must be in the mind of the researcher some ideal, which he knows may not be attainable in its conceptualized form, but towards which practice should move, or by which practice may be tested. To fail to have such an ideal (based on observable events and facts) is to fail too as a researcher, for research requires an imaginative approach to the facts, even perhaps a fanciful approach, though never fanciful conclusions. (Chambers Collection, Letters, 1955)

Chambers (2000) described the Renaissance as the 'matrix of the enormous surge of investigative, exploratory and inventive activity' where thinkers speculated on the 'nature of things'. A major element of Chambers' 'Renaissance thinking' and ongoing inquiries was his continual recourse to 'quantification' of asset valuation practices. More recently, Crosby (1997) has shown that quantification was integral to all of the major developments during the Renaissance period, including accounting. Throughout an extensive academic life spanning nearly six decades, matters of accounting valuation were of great interest to Chambers. While the settings for his several hundred articles and dozens of books and miscellany differed (these are listed in this *Festschrift* in Chambers' 'Aide-Memoire'), it is evident from his work that valuation was a pervasive theme.

Frank Clarke's essay exploring Chambers' ideas on price and price level variations adds weight to Chambers' convictions regarding valuation. For a balance sheet to be serviceable, it must inform users of the wealth and progress of firms. Clarke notes:

> Measurement, monetary measurement in particular, occupied him in the context of the application of arithmetical rules to financial data—matters that he had tinkered with in those earlier [1940s and 1950s] papers. These were matters that he had to resolve before entering the [1960s price level] debate. Although no more so than the others delving into the inflation accounting problem, he was too unprepared to proceed further in the debate. The difference was that he realised it; they did not!

Allan Barton's contribution shows how the fundamental nature of Chambers' system and its major competitor, current cost accounting, were related to the economic theory of the firm and its associated theory of optimum resource allocation. Barton notes that Chambers' new theory 'was quite revolutionary in the context of accounting theory for the rigour of its arguments, its breadth of knowledge embodying a multidisciplinary approach, and its model of accounting measurement'.

Another indication of Chambers' Renaissance thinking was his continuing search for order, classification, synthesis and reliance on principles as the basis of any attempts to reform accounting thought and practice. He expressed these ideas in the previously unpublished 1989 Gordon Fellow public lecture, 'Common Sense, Technology and Science', in which he describes the function of academe and academics: 'In matters of consequence to ourselves that entail dealing or interaction with others, we must therefore be constantly on guard against confusing facts with figments or fictions. To help maintain that vigil is among the functions of scholars and institutions of higher learning.'

Chambers provides insight into his pursuit of 'professing the truth and exposing false doctrines' and provides a portent for today's investors in the following extract from his notes prepared for the previously unpublished Probus lecture:

> On the fringe, one confronts criticism from all sides. But to be sure of one's ground one must imagine more potential flaws than the common critics. It becomes a battle with oneself not with others. Pushing oneself to the limit is the ambit of all physical and intellectual venturers. On the face of it my colleague [Bob] Sterling and I have been swamped with all the outward marks of acclaim—medals, citations, invitations, access to publications, professional and academic awards (10 times US, 10 times UK). But what we have stood for remains unlearned. That's life on the fringe. Think of all the once eminent MBAs whose castles have tumbled about their feet. A sense of history may have saved them and accounting from the make-believe world of creative and cosmetic accounting. For it is a product of this century. Perhaps someday we will learn a new idea is never adopted on its merits—its success continues until a new generation learns better.

Continuing with Chambers' views on science, the following extract from his 1989 Gordon Fellow lecture appositely captures his ideas:

> On the other hand, *Wissenschaft*, the German word for science, 'included historical and classical studies as well as the natural sciences . . . The notions that [the nineteenth-century German academic system] most strongly encouraged were those of painstaking care, loving attention to detail, precision of language and of argument' (Ziman, 1968, 85). Exactly the same virtues, of course, were expected of the natural sciences in Britain. In effect, then, the scientific status of all kinds of inquiry subsisted not in particular groupings of things open to observation nor in particular technical methods of observation; but in the care with which things were observed, generalizations were made, and inferences were tested. To observe, to reason and to report with care is nothing more than common sense applied to common experience. [And further] . . . Clearly then, there is little or no merit in the view that scientific inquiry may or can dissociate itself from practical matters. But is it not perhaps the case that scientific work is an entirely different kind of pursuit than art or technology? Even that seems questionable from the dicta of scientists themselves. Campbell, a physicist, averred that 'nothing could be more absurd than the attempt to distinguish between science and art . . . For science, like art, seeks to attain aesthetic satisfaction through the perceptions of the senses; and science, like art, is limited by the impositions of the material world on which it works' (1919/1957, 227). A medical scientist has advanced equally pointed observations: 'By some the scientist is regarded as a man who, working by well tried rules of logic and experiment, has made himself independent of artistry and intuition. This is entirely false. The really great scientist is always a great artist . . . By some the artist is regarded as a man who owes little or nothing to working hypotheses or experimental tests. This is an even more dangerous fallacy' (Topley, 1940, 37).

While eschewing the research method Chambers adopted, Michael Gaffikin's *Festschrift* contribution describes Chambers as an innovator who drew upon extensive reading in philosophy, science, organizational behaviour and economics in developing his ideas. Gaffikin concludes that Chambers'

> 1950s and 1960s theoretical works were seminal contributions to methodological inquiry in accounting. They sought to rectify the lack of theoretical foundation in accounting thought and the observed *ad hoc* rules of accounting practice. While annoying many, including the doyen of US accounting academe, A. C. Littleton, he practised what he preached and the theory he later developed followed closely precepts that were set out in those early methodological enquiries. He was attacked by a new wave of positive researchers in the 1970s but a closer examination reveals they share the same ontology and epistemological proclivities.

Applying Chambers' thoughts to the accounting domain, his 'Common Sense' lecture laments the inability of accounting academics to improve the serviceability of accounting data:

> Meanwhile the accountancy profession plies its trade, but with an undercurrent of uncertainty about its utility. And the academic branch of the profession has to a notable extent closed its eyes to the quality of what it teaches and what, in consequence, turns up in practice. On any score, this is a critical state of affairs. For if the conduct of public business and management of private business depend on calculations and messages of dubious value, all the skill and cunning that is otherwise deployed may be brought to nothing. As a matter of professional pride, specialists in these calculations and messages should not be indifferent to all this. But as I shall attempt to show, as a matter of professional pride, those specialists, may find reasons or justifications or scapegoats elsewhere than in their own field. It follows that if the efforts of managers, engineers, food, textile and chemical technologists, inventors, lawyers, financiers, promoters and men in the street may be nullified by mistaken calculations and misleading messages, all have an interest in knowing where the fault lies, and why.

Chambers' attempts to improve accounting and management education are discussed in Wolnizer and Dean's *Festschrift* contribution. Noting the major influences of his familial and early working life experiences they suggest that 'The seeds of unease and discontentment with conventional accounting and accounting education had already taken root... as a part-time correspondence teacher in auditing in the Sydney Technical College and, formerly, as a correspondence student he thought that the teaching material in accounting was "arid, doctrinaire and unimaginative"' ('An Academic Apprenticeship', Chambers and Dean, 2000, p. 102). In 'Carpe Diem' (Chambers and Dean, 2000, p. 144) he noted that 'Over 40 years ago, when I learned the rudiments of accounting in these premises [the University of Sydney], I thought accounting to be a rather trivial pursuit'.

Chambers well understood that a healthy practising art was dependent on the interplay between practice and the university, as illustrated in the following excerpt from the Preface of Chambers and Dean, *Chambers on Accounting*, Vol. II, *Accounting Practice and Education*:

> Foundations of practical expertise and of confidence in the wisdom of a profession are laid in the course of professional education and training. Rules of practice and habits of thought then learned strongly influence what is passed on to the next generation. If the colleges and universities inculcate respect for disciplined thought as the foundation of serviceable practice, graduates might acquire the habit of submitting established and proposed rules to scrutiny in the light of their experienced or prospective consequences; alternatively they might look to the universities for appraisal of existing practices and for the exploratory development of better practices. These things are characteristic of fields

> of inquiry and practice that have an established inquisitive and critical tradition. If, on the other hand, the colleges and universities provide instruction that is largely traditional and doctrinaire, the next generation of practitioners (and, indeed, teachers) can scarcely be expected to be inventive themselves, to tolerate criticism of prevalent practice, or to be sympathetic towards innovative proposals. In the mid-twentieth century accounting had no critical tradition.

Chambers' works sought to introduce a critical tradition to the accounting literature. One manifestation was consideration of how the law of company accounts might be reformed. This is well demonstrated in his 1965 *Abacus* article, 'Financial Information and the Securities Market', then eight years later in a hardback edition providing more evidence from jurisdictions in Australia and overseas. The latter appeared with a title chosen by the publisher, *Securities and Obscurities: A Case for Reform of the Law of Company Accounts* (1973). The subtitle aptly captures its *leitmotif*, although Chambers was always disappointed with the main title and felt that it had hindered wider exposure of his concerns. When the book was reprinted in 1980 Chambers chose a more descriptive and provocative main title, *Accounting in Disarray.*

Chambers' 1965 article noted that in 1960s corporate Australia there were 'a million sets of mutually exclusive rules each giving a true and fair view of a company's state of affairs', and it concluded, 'this is absurd!'. Nearly thirty years later, under the purportedly tighter accounting standards regime, two Australian academics Russell Craig and Frank Clarke demonstrated that there were still over a million 'sets of accounting data for one company in any one period' (1993, p. 60). In several private discussions in the years immediately prior to Chambers' death his frustration at this chaotic state of accountancy was clearly evident. For more than fifty years Ray Chambers did his utmost to rectify this folly, but he came to believe that his efforts were to no avail. Another of Chambers' PhD students, Bob Walker, has been invited in a forthcoming issue of *Abacus* to speculate on why those substantial ongoing efforts were not taken up by regulatory and professional authorities.

No doubt a detailed biography will reveal much more about Chambers' search, the paths followed, the frustrations he felt and the achievements. It is hoped that this *Festschrift* will excite continued interest in revealing more about this extremely impressive odyssey and thus help to provide further insights on Chambers' ideas.

My editorial comments in the February 2000 *Abacus* conclude this homage to an inspirational colleague: 'Ray Chambers was regarded by all as one of nature's gentlemen. He was a privately religious, devoted family man. His legacy will last long after those who knew him have passed away.' But in true Chambers style, the last word is his. This missal of hope is taken from a letter he wrote to a 1950s practitioner, R. N. Elliott: 'It is, moreover, an encouraging feature of the history of ideas that the heresies of today are the conventions of tomorrow. In that lies hope' (Chambers Collection, Letters, 1952).

Graeme Dean
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July 2000

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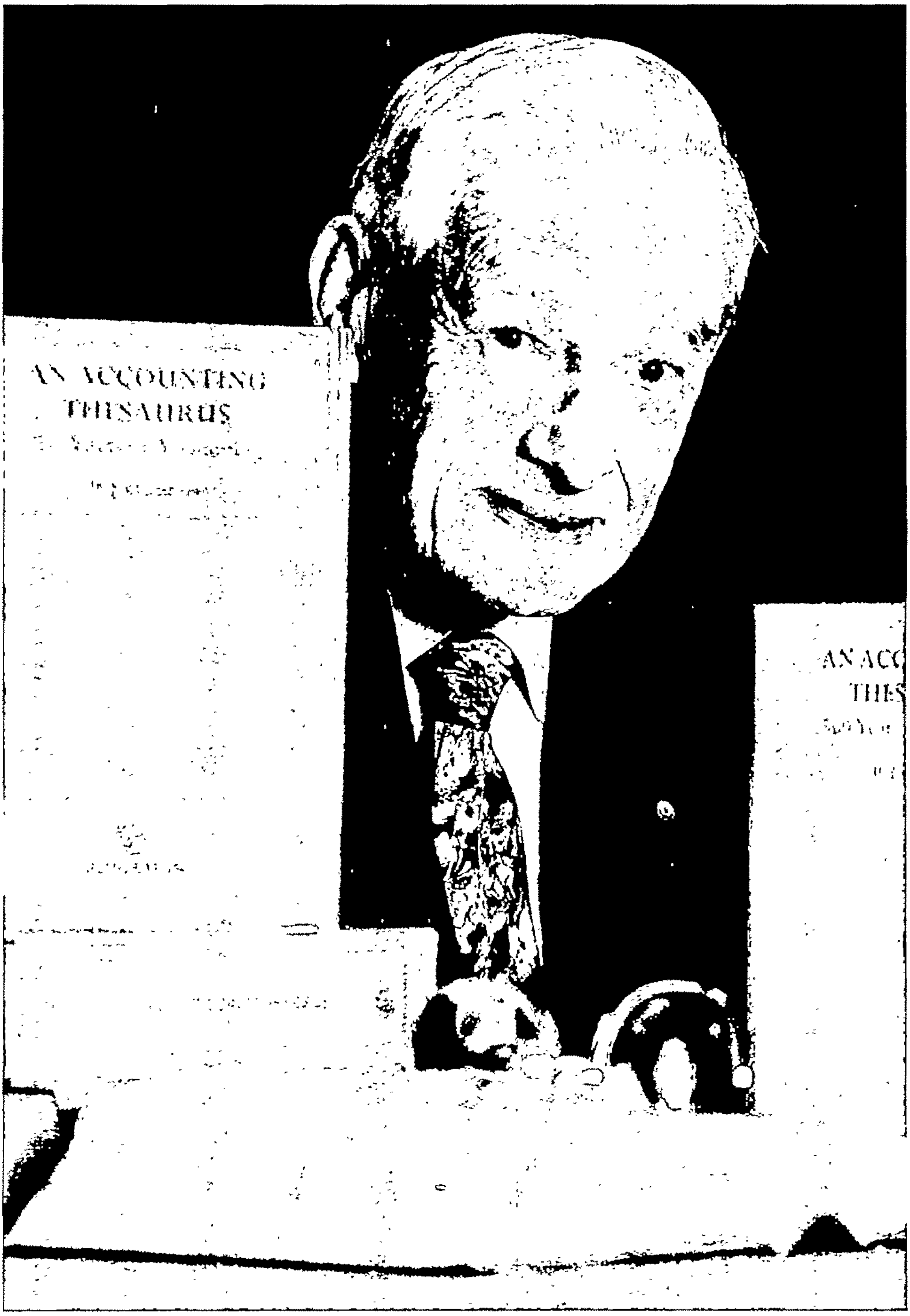
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ABACUS, Vol. 36, No. 3, 2000

P. W. WOLNIZER AND G. W. DEAN

Chambers as Educator and Mentor

Adopting a personal tone, this article explores Ray Chambers' impact on accounting and management education and through that his impact on accounting thought and practice. As mentor and colleague for over a quarter of a century, Chambers left many wonderful impressions, some of which are described here. The article describes some of the influences on the innovations and approaches of a great teacher. Familial and early working life experiences are shown to have greatly influenced his views on accounting, finance and management, and hence his innovations in accounting and management education at both the Sydney Technical College and the University of Sydney. His research, writings and teachings continually stressed the need to apply common sense to common experience. The article concludes by noting Chambers' perennial pursuit of seeking evidence to test his ideal solution to eradicate the follies and infelicities that plagued then (and still plague today) accounting thought and practice. Chambers regarded having such an ideal as the essence of being a researcher.

Key words: Accounting; Chambers; Education; Management.

> The mediocre teacher tells; the good teacher explains; the superior teacher demonstrates; the great teacher inspires.
>
> —William Arthur Ward

From our experience of Chambers as teacher–mentor, colleague and friend over twenty-five years, we knew him to be a great teacher. So too did many of his former students and colleagues at the University of Sydney and around the world.

We are privileged to be able to write this article in honour of Ray Chambers. In doing so, we draw particularly from his hitherto unpublished writings and one or two articles that have not yet received wide distribution. Importantly, we draw on our close association with Chambers the man. A few brief biographical snippets may help readers to interpret our comments in the context of our continuous personal association with him over a quarter of a century.

Graeme Dean came to the University of Sydney as an undergraduate student of accounting and economics in 1970 and worked as Chambers' research assistant (1974–77). We met as fellow students in a new masters degree program in accounting and financial management at Sydney in 1973–74. Peter Wolnizer had completed

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his undergraduate education at the University of Tasmania, where he studied the major theoretical accounting works of the 1960s and early 1970s under W. E. Nichols—including several of Chambers' articles, but especially Chambers (1966) and Edwards and Bell (1961).

Both of us were subsequently appointed to lecturing positions in the Department of Accounting in the University of Sydney and so became faculty colleagues of Chambers from the mid-1970s until his official retirement in 1982. He continued to be our teacher–mentor and friend until his unfortunate death in 1999. During his 'retirement' he continued to supervise Wolnizer's PhD work (commenced before 1982, and published with a foreword by Chambers in 1987) and worked with Graeme Dean as co-editor of *Chambers on Accounting*, Vols I–VI (1986, 2000) and as consulting editor of *Abacus* until his death. After Wolnizer was appointed to the Foundation Chair of Accounting and Finance at Deakin University in 1989, Chambers accepted appointments at that university as Visiting Gordon Fellow (1989), professorial associate (1990–94) and adjunct professor from 1995 until 1999, when Peter returned to the University of Sydney. We continue to aspire to his intellectual and educational ideals, and to be students of his ideas and written works.

In this essay we examine briefly some of the early influences on Chambers' 'accounting odyssey', as he described his professional life and search for purpose, system and order in the practical art or technology of accounting. We are particularly interested in the impact of his early life and working experiences for they appear to have been influential in shaping his ideas about accounting, financial management and management generally—and, indeed, especially about education in those fields. Hints and clues about those matters are found in few of Chambers' writings. We draw on material reproduced in *Chambers on Accounting (CoA)*, especially Volume II (*Accounting Practice and Education*, 1986) and Volume VI (*Logic, Law and Ethics*, 2000); writings that are published for the first time in this *Festschrift*; and the many unrecorded conversations between Ray and ourselves over many years, but especially over the last decade. We also seek to describe some of his educational innovations at the Sydney Technical College and the University of Sydney.

Apart from his brilliant intellect and dedicated pursuit of reliable knowledge, Chambers was an immensely practical man. He was also a very private person. Glimpses of his early life and working experiences—and their probable impact on his thinking about accounting and financial management—are found in his hitherto unpublished article, 'Early Beginnings', which appears in this *Festschrift*, 'An Academic Apprenticeship' (1991a, and other previously unpublished pieces which are reproduced in *CoA*, Vol. VI, 2000: 'Novocastrian Graduation', 'Carpe Diem' and 'An Educational Scandal'). 'An Academic Apprenticeship' was written as a consequence of Robert Gibson's curiosity about the major influences that had shaped Chambers' ideas about accounting. Gibson (1991) had examined the frequency of quotations from other scholars in Chambers' magnum opus, *Chambers on Accounting*, Vols I–V (1986), in an attempt to identify the intellectual influences. In conversation with Gibson during one his visits to Deakin, Chambers enlightened him that his thinking had been shaped more by his observations and experience than, perhaps, by the writings of others. Urged by Gibson to record the substance of that dialogue, Chambers wrote 'An Academic Apprenticeship' for publication in *Accounting History* (1991a).

The opening paragraph to that article gives the strongest clues:

> Some ideas stem from fortuitous sets of circumstances, some from deliberate rejection of prevalent dogma, some from a gradually emerging sense of the integral character of apparent disparate circumstances and ideas. Some survive as distinctive and novel elements of a school of thought, some drift like flotsam on the tide of what seems to be the mainstream of ideas, some are submerged or cast aside by the stream. All of these fates have befallen some ideas I have entertained. (p. 101)

And the article concludes:

> I would be guided by what seemed to be practical problems and what seemed to be practicable and technically feasible ways of resolving them. One thing was certain. The people with whom I had been associated... were down to earth people. If accounting were to be of service to them and their kind—investors, creditors and others not knowledgeable in the ways of accounting—its products likewise would necessarily be down to earth, as readily understandable as the money and money's worth with which they daily dealt. (p. 111)

EARLY INFLUENCES

Raymond John Chambers was born in Newcastle, Australia, on 16 November 1917. His brother, Albert Cyril Chambers, was born two years later. Their parents were Joseph and Louisa Chambers, both of whom came from underground coalmining families: his father from Yorkshire and his mother from Wales. Ray's father, also a coalminer, worked as a shift-working labourer in the Newcastle steelworks until he bought his own milk-vending business. That business was eventually sold and the proceeds (and credit) used to acquire a franchise to distribute Sydney metropolitan newspapers. And then came the beginning of the Great Depression.

The two Chambers boys experienced the kinds of hardship that were not uncommon for children born into Novocastrian families at that time. They spent many hours working in the family businesses, seven days a week. Such were those working hours that there was little time available for reading, cultural pursuits or engaging in co-curricular activities like organized team sports. In some of his published and unpublished writings Ray Chambers noted that neither his parents nor relatives and friends were bookish:

> My parents had no secondary education. Our home had no books that would have given a glimpse of the course of history, the world of the artistic and scientific imagination, or the discipline of the professions. Secondary school introduced me to the universe of the mind. By good fortune I encountered teachers of English language and literature, Latin, French, Mathematics and Science who were enthusiasts themselves, and would continue to share that enthusiasm with their students. But apart from the immediate programs of the schoolroom, they were lonely years. (Extracted from an unpublished, undated handwritten note on his early life, titled 'Adventure in Accounting'; it was found in Chambers' home study after his death)

And again, in a speech delivered at a graduation ceremony of the University of Newcastle in 1990:

> My father and both grandfathers were coal miners; our home was not at all bookish. I was introduced to the world of learning in the High School on the Hill, in 1929 at the top of Wolfe Street in the city [of Newcastle]. Thanks to the diligence and exuberance of some memorable masters in English, mathematics and science, I acquired an enduring interest in language and the romance of discovery. ('Novocastrian Graduation', *CoA*, Vol. VI, 2000, p. 102)

In 'Early Beginnings', Chambers paid tribute to his masters at Newcastle Boys High School: they were 'men who had an obvious enthusiasm, a love, for their subjects and a capacity to convey to students the idea that there was so much to be learned that was interesting and puzzling'. He noted that he would 'have liked to teach'. As a teacher, Chambers displayed all of those qualities—and more.

In conversation with us, Chambers often said how, during his school days, he would have loved to have had more time for reading. He used to say that he enjoyed mathematics, especially Euclidian geometry, because of its order. One can see from his earliest published works the determination to bring order to what he perceived as the chaos and confusion in conventional accounting. Search for order also underscored his distinctive and innovative approach to accounting and management education.

During his upbringing, Chambers witnessed the financial consequences of buying and selling for cash and on credit; of money being owned and owed; of acquiring and selling property and businesses, and of the gains to be had in so doing when prices of property and assets owned were rising and of the losses to be sustained when their prices fell; of times of financial prosperity and of economic depression. His experiences and observations during those years were never forgotten, for time and again in conversation he would relate how his father learnt the essentials of financial management—of the need to understand about money, credit, prices and price changes; of the imperative to keep track continuously of money and money's worth, and of property owned and debt owed. During those early years of his father's business, he observed the impact on doing business of all of those things. He saw how businesses were subject to the whims of the vicissitudes of economic and business cycles—of the highs and lows of particular markets and the economy generally. He also learnt some rudimentary lessons about business finance, especially the assessment of the risk and return associated with borrowing to obtain assets and to administer a business. He observed the importance of keeping under notice the market selling prices of assets owned and the fickle and often illusory nature of goodwill.

In 1934 Chambers won an exhibition (an award relieving the holder of university tuition fees) that enabled him to continue his study of accounting—commenced through a private correspondence course—as a part-time student in the Faculty of Economics in the University of Sydney. He did so while occupying a clerical position in the accounting office of the Department of the Attorney-General and of Justice in the New South Wales Public Service. He graduated with the degree of

Bachelor of Economics in 1939. The previous year he left the public service to join the Shell Company. He worked as an inventory control officer, keeping track of the quantities of all products and transportable containers spread throughout regional depots in New South Wales, and later did similar work for bulk quantities of imported crude oils. He not only learnt the importance of keeping accurate records of physical stocks and movements, but of measurements—volumes, weights and temperatures. He noted in 'Early Beginnings' that 'To an untutored novice, keeping track of those stocks and movements in them seemed to be a humdrum task, necessary perhaps, but why so constantly in such detail? That is the kind of question that bedevils all who experience parts of a process but never see the whole. The answer is often a long time coming.' The significance of that question and its answer in Chambers' mind is apparent in the development of his ideas about accounting—especially, perhaps, of the empirical nature of measurement.

Importantly, Chambers proposed the far-sighted idea that the effective management of organizations that traded in physical goods required managers to be informed by factual and up-to-date information about the physical flows and stocks of goods as well as financial information of the same kind. In many ways, his ideas presaged the 1990s notion of the 'balanced scorecard' by nearly fifty years. Consider the following extract from 'An Academic Apprenticeship':

> My experience of manufacturing and distribution was of firms that depended for action on prompt factual information on physical flows and stocks, and on physical specifications of inputs and outputs and indicators of performance. By contrast, the kind of accounting I had learned, and on which all firms presumably depended, was of the conventional, historical kind—long out of date in many respects and having little relation to immediate exigencies, except for cash, receivables and payables. (1991a, p. 103)

From the Shell Company, Chambers went to work in the Electricity Meter and Allied Industries as a supervisor of inventory and production control (1941–3) and from there to the Australian Prices Commission (1943–5) as an investigation officer. Of his work experience before his first teaching appointment, he noted that

> The first three positions had no obvious association with matters financial . . . The prices control office was somewhat more promising. A wide range of products and processes came under observation; price regulation . . . had a reasonably clear object. Financial statement analysis was an important part of the monitoring process . . . But the modes of determining offer prices and of calculating profits were noticeably diverse, even within particular industries . . . (1991a, p. 102)
>
> Experience in the price regulation setting had revealed the almost random diversity of financial calculations that would in some way turn up in balance sheets and profit and loss statements. Brought up on basic economics—the ideas of economizing at least, profit maximizing at best, and the adaptive behaviour which the theory of market economics entailed—there seemed to be no place for the conventional accounting stuff. (1991a, p. 103)

The seeds of unease and discontentment with conventional accounting and accounting education had already taken root. He stated that, as a part-time correspondence teacher in auditing in the Sydney Technical College and, formerly, as a correspondence student he thought that the teaching material in accounting was 'arid, doctrinaire and unimaginative' (1991a, p. 102). In 'Carpe Diem' (2000, p. 144) he noted that 'Over 40 years ago, when I learned the rudiments of accounting in these premises [the University of Sydney], I thought accounting to be a rather trivial pursuit. The rules seemed to be vague, often contradictory, and often offensive to common sense.'

Further hints that his intellectual unease with accounting education date back to his earliest experiences as student of the subject are indicated in another of his unpublished, handwritten and undated notes, titled 'An Adventure in Accounting':

> I learned the rudiments of accounting in the late 1930s and early 1940s partly through two undergraduate courses in the Faculty of Economics of the University of Sydney, and partly by commercial correspondence courses. The university study material consisted of two slim volumes written by the lecturer, himself a practising professional. The correspondence course material was a series of booklets written under contract by tutors of the correspondence school, amounting in volume to perhaps 2,000 printed pages of [formulary] description, illustrative examples and progressive exercises.
>
> In both cases progress in learning was according to the book. One acquired certain technical skills in dealing with the cut-down problems by which bookkeeping operations were exemplified. It was rote learning. The kernel of the programs was double-entry bookkeeping. There was no hint of a literature beyond what was prescribed, no hint of events and processes that may have given form and content to what was taught, and no indication of the variety of the commercially important uses to which the products of accounting may have been put in the community at large. No real-world examples—of annual financial statements, prospectuses, secured loan trust deeds—were provided. Selected extracts from judgments in litigated cases were used as authority for some of the course dicta. But they were the principal hints that the work of accountants and auditors occasionally attracted critical notice.

Chambers' passion and thoughtfulness as an educator were made plain in his first article about accounting education, 'The Training of Accountants' (1948). It was his third published article. In contrasting 'training' with 'education' he suggested that

> Education may be considered as a process by which the innate qualities of the student are drawn out and developed, and by which the student's mind is enriched both because of the experience suffered and because of the knowledge gained. Teaching to be really educational should, therefore, aim to provide such stimuli for the student that he goes forward seeking an understanding of the principles of his subject rather than sitting back smug in the knowledge that he 'swatted' the correct material for his examination. (p. 322)

And through his entire academic career over the next half century Chambers was unerringly diligent in his desire as a teacher to 'draw out and develop' the innate qualities of his students. His maturity of thought about vocational training and education from his earliest days as a teacher are remarkable; his observations and insights being as relevant today as they were fifty-two years ago:

> The type of intellectual exercise most eagerly sought today is training for the purpose of following a selected vocation. The student is concerned more with the acquisition of a few formulae, cut and dried dogmas or rules of thumb fit for immediate practical application, than with the development of an outlook on life, an underlying code or philosophy by which his approach to vocational and personal problems may be guided. There has been, even among so-called 'educators', a tendency to mistake the shadow for the substance in training their protégés, with the result that the latter go out to face the problems of

> business or profession armed only with the limited range of remedies their 'practical' studies have brought before them . . .
>
> The mental discipline which seems to me to be most useful and practical . . . is just that which has so roundly been condemned as 'theoretical' and 'impractical' and 'academic' by so-called practical hard-head men of affairs. (pp. 321–2)

That Chambers was an accounting educator well ahead of his times is made manifest in the drift of argument and curriculum suggestions in that 1948 paper. Nothing in his subsequent writings or practices as a teacher contradicts those early admonitions.

SYDNEY TECHNICAL COLLEGE

In 1945 Chambers joined the staff of the Department of Industrial Management in the Sydney Technical College. He noted in 'An Academic Apprenticeship' that:

> At the end of the war, an extensive educational and rehabilitation program was provided [in technical colleges in the principal Australian cities] for the vast numbers of people whose careers had been interrupted, including supervisory and managerial studies . . . The head of the department [of Industrial Management at Sydney Technical College], Bruce Brown, a Sydney economics graduate, had extended the course offered to include production management, sales management, personnel management—and a unit with the unpretentious title, costing and cost control. I was engaged to give this last my special attention. (1991a, pp. 102–3)

Chambers thought it odd that attention should be given to the management of production, sales and personnel, but not to 'financial management'. He also observed that, hitherto, no attempt had been made in the teaching programs of colleges and universities nor in the general textbooks 'to link accounting firmly with the management of the financial aspects of business' (1991a, p. 103). And so, Australia's first course in financial management was conceived, designed and taught.

After just two years at the Sydney Technical College, Chambers produced his first book, *Financial Management* (1947)—a highly innovative work of 442 pages, the only one of its kind to the present day. It ran to four, rewritten, editions (1947, 1953, 1967, 1986). In his preface to the first edition, Chambers displayed amazing understanding of the principal problems with conventional accounting, its dislocation from financial decision making and management, and the 'splendid isolation' of accountants and their speciality 'from other aspects of the business in which they were engaged' (p. vii). Many of the ideas unveiled for the first time in *Financial Management* were to be elucidated with prodigious clarity and depth in his subsequent writings.

Financial Management was foundational and located accounting firmly within the context of financial management and market action. In his foreword, Bruce Brown declared the work to be 'the first full-length treatment of Financial Management by an Australian writer and one of the few so far produced by an Australian on any Management Subject' (p. vi).

During his eight years on the staff of the Sydney Technical College to 1953, Chambers wrote the first two editions of *Financial Management* and had fifteen articles published in a variety of journals, but mainly in *The Australian Accountant*, the journal of his professional body (see Chambers' 'Aide-Memoire' for details). Furthermore, he devised and delivered (in part) Australia's first management education program (1948–53)—the Sydney Technical College Diploma in Management Studies, a five-year, part-time, program.

THE UNIVERSITY OF SYDNEY

In 1953 Chambers was appointed to a Senior Lectureship in Accounting by the University of Sydney. He was that university's first full-time academic appointment in accounting. He was promoted to associate professor in 1955, and in 1960 was appointed to Sydney's Foundation Chair of Accounting—a position he held with great distinction until his official retirement in 1982, at which time he was appointed as professor emeritus. With his appointment to the first chair of accounting, the university established a Department of Accounting. As head, Chambers led the department with intellectual rigour and uncompromising integrity until 1975, when Murray Wells—Sydney's first PhD graduate in accounting and second professor of accounting—took the reins.

Chambers' educational innovations continued. Accounting education at Sydney was to have firmer, more rigorous intellectual underpinnings than the conventional kind. A merely technically focused accounting education would not do. Advanced coursework was introduced in the undergraduate accounting curriculum in 1953 in the form of two new units of study—Theory Construction and Analysis and History of Thought and Practice. The new, rigorous curriculum was motivated by his educational ideals and aspirations for students set forth in the 1948 paper, and informed by his own scholarly inquiries—see his published works during the mid-1950s, but especially the renowned 'Blueprint' papers (1955; 1957).

In their preface to *Chambers on Accounting*, Vol. II (1986), Chambers and Dean wrote:

> The foundations of practical expertise and of confidence in the wisdom of a profession are laid in the course of professional education and training. Rules of practice and habits of thought then learned strongly influence what is passed on to the next generation. If the colleges and universities inculcate respect for disciplined thought as the foundation of serviceable practice, graduates might acquire the habit of submitting established and proposed rules to scrutiny in the light of their experienced or prospective consequences; alternatively, they might look to the universities for appraisal of existing practices and for the exploratory development of better practices. These things are characteristic of fields of inquiry and practice that have an established inquisitive and critical tradition.

However, they noted that by the mid-twentieth century accounting had no critical tradition. Only a few notable critics—such as Paton, Hatfield, Canning, Sweeney and MacNeal—had emerged. However, the 1960s and 1970s 'were marked by increasing disquiet, among governmental and regulatory authorities, with corporate accounting practices that yielded misleading information and masked actual or potential financial distress' (Chambers and Dean, Preface to *CoA*, Vol. II, 1986). And so it was that with the introduction of fourth-year honours, masters and doctoral programs in accounting in 1957, 1966 and 1972, students at Sydney were exposed to a more rigorous, inquiring and critical accounting education than that generally offered elsewhere. Chambers also introduced a night-time MEc/MBA program in 1970 which was the precursor of the University of Sydney's Graduate School of Business. It was oriented to financial management, as had been his courses at the Sydney Technical College.

The theory construction and history of thought units of study underwent continual refinement and became the coursework platform of postgraduate accounting programs at Sydney. In 1967 they were designated the Foundations of Continuously Contemporary Accounting and the Development of Accounting Thought. Both units of study were novel. The former unit was subsequently extended and developed by Chambers during 1990–1 when Wolnizer (then Dean of the Faculty of Business and Law at Deakin University) asked him to prepare it in text form for use by all graduate accounting students enrolled on and off-campus at Deakin. The resulting *Foundations of Accounting* (1991b) is a highly innovative intellectually stimulating educational text on the theoretical foundations of accounting. Its aim

> is to focus attention on some of those ideas that, severally, underlie prevalent practices, and that, in conjunction, yield an accounting that is realistic, theoretically supportable and practically serviceable. [It does so by drawing] on observations and conclusions of specialists in fields of knowledge and technology other than accounting, that have a demonstrable bearing on elements of accounting, thought and practice... The ideas they express are believed to command the confidence and endorsement of specialists in their own fields, and generally they are consistent with informed commonsense. The principles that govern, or should on logical and practical grounds govern, the practice of accounting, emerge from the convergence or conjunction of those ideas. (p. 1)

A cursory glance at the table of contents sets before the reader a rich tapestry of learning experiences that are in prospect. After examining the 'nature of foundations' and the 'domain of accounting', the reader is exposed to reliable ideas from eleven fields of knowledge that bear upon accounting in the form of commercial, legal, economic, financial, metrical, psychological, axiological, organizational, linguistic, social and data-processing foundations. The pedagogical form of the text exemplifies student-focused learning. Like so many of Chambers' works, it is unique. And, like several of his earlier works, it deserved a far wider audience than it received.

Much of the material used in the Development of Accounting Thought unit was subsequently compiled and expanded into a conveniently arranged volume by Michael Gaffikin and Michael Aitken, two Sydney colleagues in the early 1980s. In their introduction to *The Development of Accounting Theory* (1982), they acknowledge that

> we discovered, at the University of Sydney, Professor R. J. Chambers, had, with his typical intellectual thoroughness, developed a comprehensive course in the development of accounting thought... Rather than rely on the usually superficial 'appreciation' of past writers' works given in so-called accounting theory texts, it was considered better to study the actual works. (p. 1)

Like Chambers' Development of Accounting Thought unit of study, the Gaffikin and Aitken anthology covers the major works (full details of which appear in their book) written by Sprague (1907), Hatfield (1909, 1927), Paton (1922), Canning (1929), Scott (1931), May (1936), Sweeney (1936), Gilman (1939), MacNeal (1939), Vatter (1947), Littleton (1953), Moonitz (1961), Edwards and Bell (1961), Mattessich (1965), Chambers (1966), Ijiri (1967), Sterling (1970) and others. Excluded from Gaffikin and Aitken, but included in the Sydney unit of study were the major committee reports on accounting (e.g., *A Statement of Basic Accounting Theory*, 1966, and *Statement of Accounting Theory and Theory Acceptance*, 1977) and monographs such as that written by Sanders et al. (1938). Students at Sydney were required to study and criticize the major hardcover accounting literature. Later, another unit was introduced—Contemporary Issues in Accounting—that required the study of contemporary journal literature.

Attracted by the prospect of studying the multifarious aspects of Continuously Contemporary Accounting (CoCoA), there came to Sydney during the 1970s the largest group of PhD students to have assembled in an accounting department in an Australian university to that time. Over the years, more than a dozen Sydney accounting graduates have been appointed to professorial chairs in major universities in the U.S.A., U.K. and Australia. Not all had the privilege to be taught and inspired by Chambers, and many were not sufficiently persuaded by the cogency of his arguments or the abundance of evidence he adduced to support them as to seek to extend his work. Nevertheless, we hope that all who had the good fortune to study accounting at the University of Sydney during the Chambers years would concur with the sentiment expressed by Wolnizer in his inaugural professorial lecture:

> My sentiments when embarking upon a career in research are aptly expressed in the words of the Nobel prize winner, François Jacob (1965, p. 219), who said in his Nobel lecture: 'I was fortunate enough to arrive in the right place at the right time. At the right place because there, in the attics of the Pasteur Institute, a new discipline was emerging in an atmosphere of enthusiasm, lucid criticism, nonconformism, and friendship. At the right time, because then biology was changing its way of thinking . . . A rare moment in which ignorance could become a virtue.' For me, the right place was the Department of Accounting in the University of Sydney, and the 1970s the right time. There, a new theory of accounting—continuously contemporary accounting (universally known by the acronym CoCoA)—had recently emerged, which gave promise of the eradication of all the serious flaws in conventional accounting thought and practice. (1990, p. 7)

Certainly our experience of life in the Department of Accounting at Sydney during the 1970s and 1980s was precisely as depicted by Jacob. Competition among colleagues was keen, and the atmosphere was indeed one of 'enthusiasm, lucid criticism, nonconformism, and friendship'. We could not have served a more wonderful academic apprenticeship. Our debt to Ray Chambers is beyond measure.

FINAL THOUGHTS

Some may have questioned why Chambers was so passionately committed to the reform of accounting education and practice. Against seemingly insurmountable odds, he refused to turn either to the left or to the right in his pursuit of a reliable corpus of accounting knowledge, unless convinced by compelling reasoning. His idealism as scholar and educator knew no bounds. His selfless investment in the education of his students was exemplary. Such was the measure of his intellectual integrity and educational dedication. His prodigious and visionary scholarship is there for all to see.

A clear statement of his motivation is provided in his vision for 'Accounting Education for the Twenty-First Century' (1987):

> To be in the vanguard of advances in knowledge and technology is at once a duty and a deep satisfaction to educators. In particular, improvements in instrumentation and information systems have made possible previously unforeseen advances in performance, diagnosis, and prognosis in all kinds of pursuits. The prospect of doing similarly for the conduct of business affairs still lies before an improved accounting. The necessity and direction of improvement I have attempted to sketch. But of the grounds for improvement may I say, in the spirit of the Royal Society maxim: Take not my word for it; see for yourself. (p. 106)

Those who studied under Chambers could never say otherwise than that this maxim underscored his educational principles. The exhortation, indeed expectation, to observe, to inquire, to read, to question and to think for oneself was the hallmark of an intellectual engagement with him. Together with his published scholarship, this is the rich intellectual legacy he has bequeathed to his students.

That Chambers was an extraordinarily well and widely read man is immediately apparent to the most casual reader of his work, but powerfully manifested in his seminal works, *Accounting, Evaluation and Economic Behavior* (1966) and *An Accounting Thesaurus: Five Hundred Years of Accounting* (1995). He cited Francis Bacon (1620/1988, p. 89), who nearly 400 years ago observed that even

> in the customs and institutions of schools, colleges and similar places of resort, set apart as the abodes of learned men, and for the cultivation of erudition, everything is found to be hostile to the progress of knowledge. For lectures and exercises are so disposed, that it does not easily occur to anyone to think or meditate on anything out of the customary routine.

In a speech delivered in 1991, titled 'An Educational Scandal', he noted, with dismay, that 'In accounting it is still the same today. Habit and tradition, copying and timidity, remain the dominant features of textbook writing and educational practice; they are as "dogmatical" and unscientific as they were 150 years ago' (*CoA*, Vol. VI, 2000, p. 150).

And his understanding of what stood in the way of accounting progress?

> These two fallacies—fallacious aggregation and the fallacious belief in the utility of out of date information—provide a recipe for all that is disorderly, dangerous and often disastrous accounting practice. Instead of revealing, they conceal the facts. Instead of disciplined accounting, we have creative accounting. Instead of concise, intelligible reports, we commonly have four pages of financial statements and 20 pages of unintelligible footnotes. (*CoA*, Vol. VI, 2000, p. 150)

With regret and an abiding concern for the quality of accounting education, he noted that the three-volume report on *Accounting in Higher Education in Australia* (1990) 'covered all kinds of things—course duration, class size, teaching methods, teaching loads, funding and so on; but there was scarcely a word on the intellectual content, the logical rigour, or the practical utility of what is taught' (*CoA*, Vol. VI, 2000, p. 151).

And finally, what were his own views about the role and deepest satisfaction of being a teacher? In an address at the University of Sydney Accounting Foundation Dinner held in his honour on 27 July 1991 to celebrate the conferral upon him of the Outstanding Accounting Educator Award by the American Accounting Association and his election to the Accounting Hall of Fame in the Ohio State University he provides an insight:

> What part of all that has merited the awards of which you have heard I have no idea. But my greatest personal satisfaction has been in the academic and career achievements of graduates and colleagues in my home university. I have a firm belief that all who set their minds and hands to tasks of their choice can do better than they thought they could. It has been my privilege to encourage many to believe that of themselves. ('Carpe Diem', *CoA*, Vol. VI, 2000, p. 145)

For our part, we can but say that our greatest professional privilege is to have been taught and mentored by Ray Chambers. He not only inspired us, but he reposed in us a much firmer belief in what we could achieve than we could have imagined as raw, but ideologically hopeful, students in 1973.

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MURRAY WELLS

Founding *Abacus*: Frustration to Fulfilment

This article explores the visions and frustrations of Chambers as he and others sought to establish a leading international academic accounting journal in the early 1960s. The imposition of rigorous standards and the lack of initial interest from academics around the world were two frustrations that Chambers had to overcome. He remained flexible regarding what subject matter and method would be acceptable in research studies encompassing the broad spectrum of accounting and business studies. *Abacus* sought to provide an outlet for papers (of larger length if needed) analysing practical accountancy and business studies and comparing details observed with the prevailing or proposed outlines of knowledge in the relevant area. Finally, the article reveals insights into Chambers' doggedness as he sought to overcome the frustrations and eventually managed the process resulting in *Abacus* first being published in 1965.

Key words: Development; Ideas; International accounting; Journal.

IN THE BEGINNING

In 1953, Ray Chambers was appointed to a senior lectureship in accounting in the Faculty of Economics in the University of Sydney. Dyckman and Zeff (1984) have described 'research' in accounting in the period just after that, to the extent that it was represented in *The Accounting Review*, as follows: 'Popular subjects were income-tax allocation, depreciation, direct-costing, joint-cost analysis, price-level accounting, and the need for funds statements. The articles ranged from thoughtful and nontendentious presentations to others whose logical development was often more perfunctory and occasionally one-sided' (p. 227).

There were, at that time, only two academic accounting journals that could make any claim to being research oriented: *The Accounting Review* in the U.S. and *Accounting Research* in the U.K. *Accounting Research* had been published by Cambridge University Press for the Society of Incorporated Accountants' Research Committee. In 1958, it was incorporated with the monthly professional journal *Accountancy*. This effectively killed any pretense the British professional accounting bodies might have made of encouraging research publications in accounting.

Chambers' concern with the lack of outlets for research first became apparent in 1960. By that time, *Accountancy* had become the official journal of the Institute of Chartered Accountants in England and Wales (ICAEW). On 20 June 1960, Chambers wrote to a former editor of *Accounting Research*, F. Sewell Bray, seeking

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advice on the terms on which the research journal had been subsumed by the professional journal.[1] Bray was a practitioner with a substantial reputation for research; his opinion and, if necessary, his influence would be helpful to Chambers' plans. And plans for a new journal were clearly being formulated:

> I have been toying with the idea of launching an accounting journal which would serve at least in this country a need for rather more serious material than usually finds its way into the journals of the professional bodies. I heard that on the amalgamation of the Society of Incorporated Accountants with the Institute of Chartered Accountants, the latter acquired the right and title to the journal you fathered, 'Accounting Research'.
>
> No doubt you will agree that 'Accounting Research' is a very neat and attractive title and one which might well be sought after by other publishers. I think it would be proper to write to the Institute asking permission to use the title.

Bray was not very hopeful. He replied: 'I have consulted my previous co-editor of "Accounting Research" and he feels quite sure the Institute would take quite a definite view and that they would not be willing to allow the title "Accounting Research" to be used in the way that is suggested' (7 July 1960). Bray was clearly in favour of Chambers' plans: 'I personally, of course, would welcome it . . . you have every blessing from me'. But he advised against using the title.

Despite the advice, Chambers decided to test the water. On 11 August 1960 he wrote to the ICAEW advising that:

> The Department of Accounting in this University is contemplating the publication of a journal which shall be devoted to theoretical, comparative and historical studies in accounting and closely related fields . . .
>
> It has been suggested that the title of the journal shall be 'Accounting Research' as this clearly denotes its intended nature.

The institute was not amused. The deputy secretary, F. M. Wilkinson, promptly replied with the advice that since the demise of *Accounting Research*, 'the title page of Accountancy has borne the words "Incorporating ACCOUNTING RESEARCH"'. 'In these circumstances,' he suggested, 'I feel sure you will agree that this Institute could not regard as appropriate the use of the title "Accounting Research" for your proposed journal' (16 August 1960).

Not to be deterred, Chambers tried 'Accounting Research International' (31 August 1960). That was not acceptable either. According to Wilkinson, 'One of the features of Accounting Research when it was published separately was that it was essentially of an international character and in my view the adoption of the title "Accounting Research International" for your proposed journal is not likely to be regarded as at all satisfactory by this Institute . . . I hope that you will agree that some title should be found for your proposed journal which will not bear similarity to Accounting Research' (7 September 1960).

This was too much for Chambers. His reply displays his irritation:

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[1] All correspondence is from the files of Raymond Chambers from 1946 to 1999, part of what is collectively described as the Chambers Collection currently being catalogued for permanent storage at the University of Sydney.

> Your letter of 7 September appears to interpose a number of difficulties between the project we have in mind and its realisation. You say you believe that any title bearing similarity to Accounting Research would not be regarded as a satisfactory journal title by the Institute. Is it to be inferred from this that objection would be taken to a title which includes 'Accounting' separately or 'Research' separately or simply 'Accounting Research' together, or in any combination? (27 October 1960)

The reply was courteous, but firm:

> I have now reported to the General Purposes Committee of the Council the correspondence commencing with your letter of 11th August and ending with mine of 1st November 1960. The Committee confirmed the views expressed in my letters of 16th August and 7th September 1960 and would regard the adoption of the title 'Accounting Research' or 'Accounting Research International' as an infringement of this Institute's rights. (Wilkinson, 2 December 1960)

The committee added an afterthought: 'It would not object to a title such as "Australian Accounting Research" which clearly indicates that your publication is an Australian publication'. Chambers ignored the suggestion, presumably because he had in mind a journal that would be truly international. Restricting it to Australia was not part of his plan. On 9 December 1960, Chambers tried again: 'Could you please tell whether any objection would be taken to the use of the title "Research in Accounting"?'

The response from Wilkinson was a little more conciliatory: 'I am pleased to tell you that the Committee would not object to the use of the title "Research in Accounting"' (22 December 1960). This appears to have satisfied Chambers, and there is no further correspondence on file relating to the institute's interest in the matter. Indeed, when the first statement of Chambers' intentions appeared in February 1962 it was headed:

> 'RESEARCH IN ACCOUNTING'
>
> It is proposed to launch a new journal, of an international character, under the title 'Research in Accounting' or 'Accounting Studies' or something similar. Its purpose will be to provide a learned journal serving the world-wide fraternity of serious students of accounting—whether in practice, in industry or in education.

(The full statement is reproduced in the Appendix to this article)

Interestingly, when the University of Chicago began planning for its new journal, those involved also wrote to the ICAEW 'to see if they would object to our using the words *accounting research*' in the title of their journal. The reply, according to Sidney Davidson, was 'somewhat testy'! Nevertheless, the Chicago group decided to use the name *Journal of Accounting Research* (Dyckman and Zeff, 1984, p. 284). There is no evidence that the ICAEW raised any further objections.

When Chambers heard about the proposed title of the Chicago journal, he advised Davidson (somewhat disingenuously) that he, too, had had some difficulty with the institute in London: 'Correspondence over several months yielded nothing, so I proceeded without bothering about that title' (15 May 1962). In December 1962 Chambers wrote to a number of people, including Gerry Mueller and Maurice Moonitz, advising that 'I am hopeful that the first issue may see the light during 1963 and that I will have enough material in hand for two issues before giving publicity to the journal. I am thinking of calling it "Abacus", with a descriptive title' (Correspondence, 19 December 1962) And so it became (in 1965) *Abacus: A Journal of Accounting and Business Studies.*

In justification of the proposed title, Chambers noted in a letter to Basil Yamey at the LSE that 'It has the merit of deviation from stodgy descriptive titles, yet has something of the patina of age and universality' (8 March 1963).

THE JOURNAL OF ACCOUNTING RESEARCH

During 1961, Chambers was a visiting professor at the University of Chicago. Plans to launch a Chicago-based research journal were, apparently, well advanced, but Chambers appears to have been unaware of them. According to Sidney Davidson, the University of Chicago had been exploring the possibility of starting a new research journal in accounting for some time. He stated that 'In December of 1960 we made some studies of what it would cost to get out a journal like Accounting Research' (26 February 1962). Davidson sought the help of Leo Little, who had been an editor of *Accounting Research*, in approaching the ICAEW. He wrote to Will Baxter (at the LSE) for help in tracking down Little's whereabouts. Baxter advised Davidson that Little had died.

According to Davidson, Baxter took advantage of the correspondence to suggest that the LSE join the University of Chicago in the publication of the proposed journal (26 February 1962). This is a little at odds with Sidney Davidson's later recollection that, 'Our first plan was to have a tripartite arrangement between the University of Chicago, the London School of Economics (LSE) and the University of Sydney' (Dyckman and Zeff, 1984, p. 283). It is clear from the correspondence that the idea for a joint publication came from Baxter, and only later was Chambers invited to join the party. Davidson also recalled that:

> As the plans went forward it became increasingly clear that editorial direction and final decision making would have to be centralized. Since it appeared that most of the subscribers would be American, most of the articles would be by U.S. authors and since Chicago was providing the financial underwriting, I proposed that editorial direction and business management be located in Chicago. This was acceptable to William Baxter at LSE, but Ray Chambers felt that there was sufficient accounting research interest and activity in Australia so that acceptance of a somewhat subordinate position would be inappropriate. (Dyckman and Zeff, 1984, p. 283)

Indeed, in Davidson's opening letter of invitation to Chambers (26 February 1962), he had made the same suggestion regarding editorial arrangements 'somewhat diffidently'. Davidson recommended that David Green 'would be ideally suited for the post' of editor.

In a footnote to the Dyckman and Zeff article, Davidson states: 'There was no animosity on Ray Chambers' part—an article by him on "Why Bother with Postulates?" appeared in the first issue of JAR. He also served on the Board of Editors for several years.' Davidson's statement is correct. Correspondence between Chambers and Davidson is warm and friendly—there is not a hint of animosity. There is, however, a sense of disappointment. Davidson's invitation of February 1962 seems to have been prompted by a general letter soliciting support that Chambers had sent to a long list of people earlier that month. Davidson's name is on that list. Uncharacteristically, Chambers did not reply to Davidson until 15 May. In his reply, Chambers apologised for the delay but said that Davidson's letter 'has given me such concern that I have not known which way to jump'. He expressed surprise that the ICAEW did not alert Davidson to his plans when he wrote to them in 1961.

When he returned from leave in 1961, Chambers had brought back a plan to establish the Pacioli Society as a Sydney-based forum for discussion on accounting issues involving both academics and practising accountants. He now proposed that the society sponsor the new journal. In his letter to Davidson he states that the new journal 'was planned to be a project of the Sydney Pacioli Society and has proceeded to the point where a publisher is undertaking the necessary preliminary inquiries' (15 May 1962). Evidencing Chambers' vision, the society remains active and continues to sponsor the journal. Chambers had obviously given the implications of launching two journals considerable thought: 'It may be expecting much to suppose that the accounting world will support two such journals—but why not?' In the end, he decided to accept Davidson's invitation to join the consulting editorial group, provided Davidson saw no conflict with Chambers' plans to launch his own journal.

With the support of a grant from Arthur Young and Company, Davidson and his colleagues succeeded in launching the *Journal of Accounting Research* (*JAR*) in November 1962. Coincidentally, Chambers was back in Chicago at the time. He addressed a 'Special Session' of the 'Workshop in Accounting Research' (under the auspices of the Institute of Professional Accounting) on 13 November. His topic was 'Why Bother with Postulates?' That paper was to be the leading article in the first issue of *JAR*.

The warm relationship between Chambers and his colleagues at Chicago continued, but Chambers could not always hide his disappointment. In a letter to a colleague in Hong Kong, he noted that 'The thing [journal] has been under consideration for four years, and the recent appearance of the new "Journal of Accounting Research" to some extent steals its thunder' (Mathews, 20 September 1963). Nevertheless, in 1964 Chambers sent a cheque to Chicago to pay for a subscription to *JAR*. Davidson sent the cheque back with a note that Chambers had been appointed a 'Faculty Associate Emeritus Retired'. The duties were 'quite nominal—to think kind thoughts of the University of Chicago occasionally. The compensation would be not much greater—all we can offer is a complimentary subscription to the Journal of Accounting Research' (6 March 1964). Chambers replied in like manner: 'The depth of your delightful ingenuity and generosity I have suspected. Your letter of March 6 confirms it. The oner (as in "onerous") sits lightly on my shoulders; how else could I think of the University of Chicago but kindly?' (20 March). Some weeks after this exchange, Chambers wrote again to Davidson to advise that he had abandoned his plans for a new research journal. Chambers explained the problem: 'I have since tried diligently to make further progress, but some support on which I counted has not been forth coming and I am becoming increasingly embarrassed by delays which have supervened' (8 May). Davidson was understanding: 'I am sorry on your account to hear that you will not be able to go ahead with your planned new journal. . . . But selfishly, we would be delighted to have you join with us in the Journal of Accounting Research' (18 May). Chambers expressed his disappointment, but accepted Davidson's offer: 'Thank you for your commiserations on the abandonment of my earlier proposal. The facts were a bit hard to face, but there they were. Thank you too for your kind offer to admit me to your Board of Editors. I will be glad to serve' (26 May).

Chambers went further. He had been active in soliciting articles for his own journal, and when it appeared that his ambitions would not be realized he offered his support to *JAR*:

> You will realize that I have placed myself in a rather invidious position in relation to a small number of people who undertook to write something at my behest, and to a number of others who have promised but have not yet delivered anything. I would like to relieve myself of this burden with as much honor as I can, and my thoughts, not unnaturally perhaps turned to your Journal. (8 May 1964; American spelling in the original)

The 'one manuscript I have in tidy form' was dispatched to *JAR* immediately the author gave Chambers permission to do so.

Subsequently, however, relations may have cooled In 1965 (before I was appointed to a position at the University of Sydney) I had undertaken an empirical study of the investment hurdle rates used by a sample of companies in New Zealand. I submitted an article containing the primary results to *JAR* in 1966 and it was accepted for publication in the next issue. By this time *Abacus* had been formed and I submitted a follow-up piece to *Abacus*. As it turned out, *JAR* was running behind its publication schedule and, I assume, *Abacus* was short of copy. The *Abacus* piece appeared first (Wells, 1966). David Green, the editor of *JAR*, was incensed. He withdrew my article from the *JAR* and castigated me for my (entirely innocent) actions. As the fault lay with *JAR* (for being late) I have often wondered whether Green's somewhat intemperate reaction was due to strong competitive feelings towards *Abacus*, or was there a hint of paranoia? I subsequently met Green in Chicago and enjoyed a most cordial dinner with him. The offending article was published in *The Economic Record* (Wells, 1968).

GARNERING SUPPORT

From the outset, Chambers appears to have believed that obtaining a suitable flow of articles was the key to launching the new journal. He wrote to many of his colleagues and acquaintances in universities around the world seeking support. Paul Garner, at the University of Alabama, was especially helpful in providing lists of names and addresses. In some instances, Chambers sought the names and addresses of potential authors, but in most cases he asked the correspondents to write something for the new journal. The results were not encouraging. When explaining his reasons for abandoning the planned journal to Davidson in 1964, Chambers said that he had 'received manuscripts from U.S., U.K. and Holland, and I have promises from India, Japan and Germany'. Nevertheless, the flow of material had clearly been disappointing. Later, when the plans for his own journal appeared doomed, Chambers wrote Davidson: 'Now, whereas I have difficulty in getting together enough of these round-the-world pieces, the J.A.R. could take one or two, perhaps, per issue' (8 May 1964).

The original plans for the new journal had a strong international focus. The standard letter which Chambers sent to his many acquaintances indicated that:

> I have for many years been considering the possibility of establishing an international journal in the accounting field. The need has made itself evident particularly in connection with the studies we wish to promote in our own school; but I also believe that for the purpose of enquiry into any fundamental features of accounting it is necessary to draw as widely as possible on the thoughts and practices of people in a variety of countries. (L. Spacek, 19 June 1962)

Also, in 1963, in correspondence with Steve Zeff, Chambers complained that 'The international journal is making very slow progress, due largely to my desire to be very selective in terms of contents and to ensure that contributions are really international. I have a contribution from the U.S., and promises only as yet from Germany and India. But I shall persist even it if takes another year to get started' (28 June). It was to take longer than that, and as described above the original concept was all but abandoned. (Ironically, the U.S. contribution was passed on to *JAR*, the Indian one was rejected and the expected article from Germany never materialized.)

In January 1962, Chambers had written to a prominent Dutch accountant, Professor A. Goudeket. He was closely associated with the Dutch company N. V. Philips Gloeilampenfabricken. Philips was generally recognized as the first multinational company to experiment with current-cost type price-level adjustments in their accounts. Goudeket agreed with the need for an international journal such as Chambers proposed, but his conclusion was not encouraging: 'I hesitate whether an authoritative international magazine would be a practical proposition at this moment' (21 March). Undeterred, Chambers wrote back inviting Goudeket to become a member of the journal's editorial board. Goudeket deferred a decision: 'I should not like to commit me before having discussed things personally with you' (30 May). He proposed a meeting in conjunction with the International Congress of Accountants in New York later that year. Chambers was obviously encouraged by the meeting, which took place at the Waldorf Hotel in September, but when he wrote to Goudeket again in July 1963 he noted that 'encouragement does not mean contributions'. Would Goudeket undertake to provide a contribution to the journal? The reply was honest but, without doubt, frustrating:

> As I wrote you at the time, I am in favour of your plans but I have to refer to what you wrote yourself: 'encouragement does not mean contributions'. That is the main point indeed. I am sure that others in my country will be enthusiastic as well but I know too well how overwhelmed with work everyone is, so that no serious prospects on contributions from our side can be expected. (19 August 1963)

The correspondence inviting support for the journal was extensive. Chambers sought help from academic associations, professional bodies and his many acquaintances in identifying potential supporters and contributors. The list is impressive

—a Who's Who of accounting in the U.S. and Europe as well as a smattering of prominent academic accountants in India, Hong Kong and Japan. But the response appears to have been less than Chambers would have expected. Solomons foresaw the possibility.

> I think you may find more enthusiasm for this project outside America than in it, for in the Accounting Review we already have a journal which comes closer to what you have in mind than any of the professional English journals or, so far as I know them, anything in Australia. The demise of Accounting Research left a serious gap outside the U.S.A., but a much less serious gap inside this country. (22 February 1962)

But, like all of his good friends and colleagues, Solomons was encouraging: 'Please keep me informed of the progress of the project, and count on me to give any help I can'. Similar sentiments were expressed by many people who were then prominent within the international accounting research community, including Davidson, Vatter, Moonitz, Mueller, Solomons, Edey, Baxter, Yamey, Zeff, Staubus and others. (Vatter, it seems, had had similar plans, but decided that the projected costs were too high for the accounting faculty at Berkeley to take the risk, and they doubted that they could find '100,000 useful words per issue and two issues a year'. However, he encouraged Chambers because 'I am impressed with the paucity of really good material' in the American journals [27 January 1962].) But overall, the proposal for a new international journal from Australia elicited nothing. It is clear from Chambers' files that he was meticulous in his record keeping and filing, yet to the scores of letters he wrote there is not more than a handful of replies scattered throughout the files. Little wonder that, in a somewhat melancholy letter to Gerry Mueller of 24 May 1964, Chambers indicated that 'Things have improved little since I last wrote about a year ago . . . The wisest thing seems to be to abandon the ambitious proposal with which I began.'

Of particular interest is an extensive correspondence with a prominent management academic, Ernest Weinwurm (De Paul University, Chicago). He assured Chambers that he was 'enthusiastic about your proposal to launch a journal dealing with serious problems of accounting theory; we have been long in agreement as to the urgent need for such a publication'. Weinwurm reminded Chambers that he had recently been appointed editor of *Management International* and he was, therefore, conscious of costs. His view confirmed the comments by Vatter—the proposed journal 'Certainly could not be published in this country in view of the high costs of production'. He thought that the best place for production would be Europe. Holland is particularly cheap, he advised (15 February 1962).

A NEW BEGINNING

Chambers' disappointment in failing to launch the proposed journal is evident in many of the letters he wrote late in 1964. A note to Professor Dr K. Käfer at the Universität Zürich is typical:

> I had so much difficulty in trying to persuade contributors, and so little success, that the original proposal for the new journal has been drastically modified. I have accepted an

> invitation extended some two years ago to join the editorial committee of the Journal of Accounting Research. At the same time a group of four professors in Australia and New Zealand universities are proposing to launch an Australasian journal. We hope that we may have some overseas contributors, but it will no doubt be largely local in character in the early stages at least. I am organizer for the group. (16 November 1964)

The full story of how the group emerged was told later by Chambers in a note he prepared for the *Bulletin* of the Association of Australasian University Teachers of Accounting (AAUTA, now the Accounting Association of Australia and New Zealand) of which Chambers was appointed the first president in 1960. The 'four professors' were Roy Sidebotham (Victoria University of Wellington), Russell Mathews (Australian National University), Lou Goldberg (University of Melbourne) and Chambers. Roy Sidebotham was the initiator. He approached Chambers at the 1963 annual meeting of AAUTA with the suggestion that the association should launch a journal. Chambers was sceptical. AAUTA was only three years old and did not have the financial strength to carry a journal.

Chambers reported to the group that the response to his earlier attempts to launch a journal 'was thoroughly disheartening'. Nevertheless, he proposed that the group approach Sydney University Press (SUP), which had only recently been established, and at the same time make an application for a grant from the Social Sciences Research Council of Australia (SSRC). Chambers had made previous approaches to the SSRC for financial assistance for the journal, but without success. However, SUP accepted the proposal to publish the journal and Sidebotham promised a subvention from the Victoria University of Wellington. With that level of support, the application to the SSRC was successful. At last, Chambers had the financial backing and support he needed.

The timing of the proposal to SUP was fortuitous. The University of Sydney had been discussing the possibility of establishing a press in the traditional university manner. The well-known presses at the University of Melbourne and those of Oxford and Cambridge were cited as examples of the sort of publishing outlet the University of Sydney should have. The Senate of the University had resolved in 1962 to establish a provisional board. But it was not until 1963 that the proposal gathered strength through the receipt of a substantial bequest from Mrs Eleanor Sophia Wood. The first book published by SUP appeared in September 1965, at which time the press was also able to announce that there would be 'a new periodical for the serious study of accountancy called "Abacus"' (*Honi Soit*, 8 September 1965).

Not all the problems were over. The budget presented to SUP provided for a print run of 500, twice a year. In fact, 1,500 copies of the first number were printed, with half being distributed free as promotional copies. But in the second year of publication only 400 subscriptions had been received—'This in spite of the distribution of thousands of circulars, the distribution of gratis copies of the first issue and advertising in the local professional journals' (*AAUTA News Bulletin*, 1969). Thereafter, the number of subscribers grew slowly, to 600 in 1967 and over 800 in 1969. One of Chambers' main complaints was that the support from local academics was modest indeed. He complained that, in 1969, 'Less than 50 members of AAUTA are subscribers' (*AAUTA News Bulletin*, 1969).

Securing contributions was, according to Chambers, 'no less difficult':

> We hoped that 'Abacus' might attract articles different in kind [from the professional journals]—exploratory, theoretical, empirical, analytical, historical, biographical, bibliographical and so on; articles which could be longer, if necessary, than most professional journals tolerate; and articles on legal, organizational, financial and other aspects of business besides accounting. There seem to be fewer writers than we expected of articles of these kinds. (*AAUTA News Bulletin*, 1969)

In the 'new beginning', three people stand out through the correspondence as providing help and support for the journal: Steve Zeff (then at Tulane), Eddie Stamp (Wellington and Edinburgh) and Bob Parker (INSEAD and Manchester). They were tireless in their efforts to find both subscribers and contributors. At the same time, it is clear that Chambers would not compromise on quality as he saw it; the correspondence on virtually every article is extensive, sometimes heated and occasionally acrimonious. Chambers was conscious of the fine line he had to tread —maintaining the quality while not offending potential contributors and subscribers. In response to a suggestion from Mathews that a subscription to *Abacus* be included in the annual subscription for AAUTA, Chambers noted that 'there is a sense in which we (editorial we) may have choked off support. We have rejected quite a lot of what has been submitted. And, indeed, a lot of what we have seen written by our colleagues and published elsewhere, we would not publish' (18 March 1969).

The problem, perhaps, was that both in teaching and research in accounting, Chambers was ahead of his time in aspiring to meet the standards of the scientific community:

> The normal practice of scientific research concerns itself with details, with fitting them to prevailing or proposed outlines of knowledge, with testing those outlines by reference to the details of observable chemical, physical or biological events. It is this continual 'to-ing and fro-ing' which has been responsible for the systematic and fruitful development of those sciences. Very little that is in any way similar to this is done in accounting. We should like to see some of the results of it in *Abacus*. (*AAUTA News Bulletin*, 1969)

FRUITION

After ten years, Chambers decided that it was time to 'relinquish the editorship of *Abacus*'. He wrote to his closest colleagues, Mathews and Goldberg (Sidebotham had died in 1970), to thank them for their assistance and support, acknowledging that 'Without your help, as you know, it would have been a stillborn idea' (23 May 1974). He also wrote to Zeff and Parker that day to 'thank you for the assistance and support you have given to me and the journal over the last seven years'.

The ten years had been fruitful, indeed. The journal was not only well established, it was firmly entrenched as one of the leading academic accounting journals in the world. The subscription list was adequate (at about 1,200) if not outstanding. What had proved crucial was the large number of institutional subscriptions (in 2000 there are still around 800 institutional subscribers). Also, the geographical spread was impressive. Again in 2000 there are subscribers in nearly forty countries.

But most importantly, *Abacus* was widely recognized for what Chambers intended it to be. He had imposed rigorous standards on the level of debate while remaining flexible on subject matter within the broad spectrum of accounting and business studies.[2] He had overseen the publication of many contentious issues and he had actively encouraged papers which identified and exposed flaws in accounting theory and practice. He had no fixed idea about the type of subject areas to be published in *Abacus*. Articles could cover matters of practical import or mere curiosity: 'But there's a host of other things as well from Cloud-9 to the good earth. We have no limits except qualitative ones—for well-evidenced, well-expressed, well-reasoned-stuff, we have a voracious appetite' (*AAUTA News Bulletin*, 1969).

Chambers was unduly modest about his achievements. He had every reason to be immensely proud of what *Abacus* had become, and in his own way he was proud. This is, perhaps, best expressed in his own words in a letter to Zeff (23 May 1974): '[*Abacus*] has acquired a modest reputation. I guess we must be content with that.'

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APPENDIX

RESEARCH IN ACCOUNTING

It is proposed to launch a new journal, of an international character, under the title 'Research in Accounting' or 'Accounting Studies' or something similar. Its purpose will be to provide a learned journal serving the world-wide fraternity of serious students of accounting—whether in practice, in industry or in education.

There is no journal which would be recognized at present as serving this purpose. The major journals now published are sponsored by professional associations and tend to some extent to be local in character and interest. Though their circulations extend beyond their countries of origin, of necessity they serve primarily a local readership. The lack of an international journal places the development of the study of accounting at a disadvantage by comparison with other fields of inquiry. A greater exchange of information and opinion would promote this development. Knowledge of the diversity of practices and customs and laws related to accounting in different countries would enable the distinction between fundamental ideas and local incidental characteristics to be discerned. From contrasting methods and opinions may emerge the tests of principles and practices which will lead to a more rigorous theory and method. A journal of the kind envisaged might provide a more liberal background of knowledge and opinion and a greater stimulus to intellectual activity than is now available.

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[2] By 1971, Chambers could even afford a little satire. With four others, he published an article which consisted of one simple statement. Not only was the statement true, but the article met the most rigorous standards required for publication in an academic journal: The list of authors took up two lines; the footnotes were longer than the text; and the authors' affiliation took up more space than the footnotes (Chambers *et al.*, 1971).

The contents of the journal will ideally consist of articles of enduring and wide interest. In particular it would include theoretical studies; historical studies of concepts and practices; comparative studies of the concepts embodied in the practices of different countries and different periods; biographical and bibliographical studies; institutional studies, e.g. of professional and regulatory organizations and laws and regulations related to accounting. Any aspect of accounting in respect of which there are significant broad issues would fall within the scope of the journal. Aspects of economics, finance and management related to financial or cost accounting for private, business or public purposes would fall within the field envisaged, but expositions of technical operations or local matters having no broader implications would not.

In the first place two issues each year are contemplated. Each will contain say four to six articles; optimal length would be of the order of 6,000 to 10,000 words. Shorter articles would be used where appropriate, the test of any article being the comprehensiveness of its treatment of the topic on which it is written. Ideally the composition of each number will be varied as to source and subject matter.

It is believed that large numbers of English speaking accountants who are actively interested in developments in the subject are not aware of what is transpiring in countries using other languages. In conjunction with this journal, therefore, it is hoped that it may be possible to publish translations of a selection of languages other than English, together with abstracts of recent issues of foreign language journals. Material of this kind may be published in the regular issues or in occasional supplementary issues. If the general proposal is found to be practicable it may be possible to consider some form of multilingual publication, but for the moment this is deferred. The present proposal would be some attempt to break down the isolation created by language barriers.

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FRANK L. CLARKE

Chambers on Price and Price-Level Variations: Exiting Intellectual Grooves

From early in his enquiry, Chambers perceived the price variation problem in accounting to not be a separate phenomenon related to inflation or deflation, but to be the failure in conventional accounting to incorporate the full financial effects of the medium, money, in which its calculations were made and its output expressed. He absented himself from the inflation accounting focus early in the 1950s and set about an enquiry into the nature and meaning of monetary calculation and measurement, within a framework of accounting functioning to provide indications of the wealth and progress of firms. Accordingly, when the substantial literature on the topic and the report of governmental enquiry into accounting and inflation emerged during the early 1970s he addressed the various proposals by drawing upon his theory of Continuously Contemporary Accounting (CoCoA) with devastating effect.

Key words: Accounting; Continuously contemporary accounting; Inflation; Price and price level variations.

> To know what we think, to be masters of our own meaning, will make a solid foundation for great and weighty thought. It is most easily learned by those whose ideas are meagre and restricted: and far happier they than such as wallow helplessly in a rich mud of conceptions . . . A few clear ideas are worth more than many confused ones (Peirce, 1958, p. 118).

A theme threading through this article is that Chambers' approach to the price and price-level problem in accounting differed from that of his contemporaries. He abandoned the general presumptions upon which the conventional historical cost system was founded, drew upon observation rather than tradition, rejected the rhetoric of the day, dared to question the underpinnings of contemporary practice, and exited the intellectual grooves in which its doyens travelled. Another theme is that Chambers' path to his solution, his preparedness to tackle both the technical and intellectual elements of the various mechanisms proposed by the profession, individual practitioners and academics to capture in accounts the impact of price and price level changes was the outcome of a peculiar set of circumstances. His self-directed enquiry into the nature and function of financial statements, money, prices, price levels and price structures, purchasing power *per se*, the general purchasing power of money, measurement and financial quantification

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placed him always with (what Kohn, 1989, labelled) a 'prepared mind'—the ultimate polymathic.

Virtually nothing that emerged during the 1950s, 1960s and then the 1970s—first as a mechanism to inject accounts with the impact of changes in the general level of prices, then alternatively to inject them with the impact of changes in the prices of specific (generally current replacement) prices of assets, then to somewhat capture both specific price changes and changes in the general level of prices, and to adjust for changes in assets' value to the owner or their deprival values—was outside the boundary of Chambers' study. Accordingly, half-baked ideas and mechanisms received a thorough drubbing. Over-baked ideas were dismissed under an avalanche of technical and theoretical illustration, example and argument. Properly developed ideas were argued upon their own terms. But the attack was never *ad hominem*. Those whose ideas came under his attack must have wondered why he always had a quick riposte—wondered at the conceptual and illustrative melange with which they were assailed. The answer lay in that he was currently researching the fundamental principles with which accounting had to conform were it to meet its historical function and upon which all serviceable proposals had to rest.

AN ACCIDENTAL CONFLUENCE

In all respects Chambers' contributions to the debate on price and price-level variations displayed a structure and clarity mostly absent from the outpourings of those with whom he argued the issue. That clarity might well be attributed to the accidental confluence of Chambers' entry to academic accounting in the immediate post-World War II period and the pressing economic concerns of the time—the impediment relatively high taxation posed for the re-equipping of industry exhausted by the war effort and the need to recover relevant costs through revenues, particularly in the United Kingdom—though problems no less in Australia.

It will be recalled that in 1951 and 1955 the British government reported on their prior enquiries into the effects of inflation on taxation and profits; replacement cost or some other form of inflation adjustment to closing stock prices and depreciation was pleaded necessary to remove the inflation component from reported profits and taxable income. It is a matter of history that those pleas fell on the deaf ears of the government and the Institute of Chartered Accountants in England and Wales (Clarke, 1982; Whittington, 1983; Tweedie and Whittington, 1984). In Australia similar concerns prompted identical pleas, public and private alike, to adjust income at least for taxation purposes. A case presented by the Colonial Sugar Refining Company Limited (*Capital Erosion and the Income Tax Assessment Act*, 1950) is an apposite illustration of the extent of the concern.

It was against that background that Chambers began to develop his solutions to the defects of conventional accounting that he had detected during his days at the Prices Commission (Dean, 2000). Construction of published financial statements with physical assets stated at the prices paid for them in the past, or that price arbitrarily amortized to approximate the amount by which their worth had depreciated, were not serviceable for him in determining either the true costs of products or the financial status of the enterprises he was dealing with. Inflation, it will be noted, did not cause the problem so much as exacerbate it. Accordingly, 'shifting price levels' were addressed by him in a lecture before the Commonwealth Institute of Accountants' New South Wales Division in 1949, and the topical 'depreciation on replacement cost' in 1950. Again in 1951 (1952a) to the members of the Commonwealth Institute, in keeping with the pressing issue of the time, 'accounting and inflation' were pursued, and drawing upon his interest in the use of accounting data in management decisions, 'effects of inflation on financial strategy' and 'financial practice and financial policy' in 1952 (1952b, 1952c).

It would be misleading to imply that Chambers perceived inflation other than a nuisance element in the context of conventional accounting, already identified by him to be a grossly defective mechanism for discovering the wealth and progress and salient financial characteristics of firms. Whereas each of those papers was couched in the general thinking of the time—that some form of accelerated depreciation mechanism was needed to fund asset replacement and expansion—there are unmistakable signs of his focus on the big picture. In Chambers (1949), for example, he left one without doubt that he placed little credence in conventionally calculated depreciation charges, either with or without the effects currently being ascribed to the consequences of inflation (pp. 316–19). Nor had he much of a liking for the conventional methods of cost accumulation for product pricing policy (p. 318), and while some affinity for the use of replacement prices can be detected, the primary theme was that 'financial statements must inform' (p. 315). His final message in the 1950 paper exhorts 'we are essentially a service . . . businessmen must have more information . . . Inflationary conditions have challenged accountants to stand by this ideal of service' (p. 22).

INTELLECTUAL GROOVES AND THE INFLATION PROBLEM

Debate on the alleged impact of inflation after World War II was fuelled by the steady build-up of a backdrop spanning the best part of the century. First there were the solutions during the immediate post-World War I period, for example, in the U.S.A. (Bauer, 1919); the German *Betriebswirtschaftlehre* theorists, Malhberg, Schmalenbach and Schmidt, addressing the impact of the post-World War I hyperinflation; and the parallel Dutch *Bedrijfseconomie* movement (see discussion in Clarke and Dean, 1990); Paton in his *Accounting Theory* (1922) exposition of the replacement cost depreciation mechanism; the more obtuse focus of Canning (1929) on the implications of Fisher's (1911) explanations of the purchasing power of money; Sweeney's *Stabilized Accounting* (1936) treatise (quoted by Chambers, 1952c, p. 15) and *The Accounting Review* articles preceding it on essentially the inflationary impact on the accounting of German companies following the war (Clarke, 1976); and MacNeal's *Truth in Accounting* (1939). It is not surprising that, for the debate of the early 1950s in which Chambers became embroiled, he was well rehearsed. Nor is it unexpected that the general tenor of the debate at that time and in what was to follow over the next half century, captured by tradition, few other than Chambers grappled with the price and price variation problem as arising from professional prescription and practice.

In 'Blueprint for a Theory' (1955) the unmistakable seeds of setting an understanding of the nature and function of money in business affairs, its general purchasing power dimension, and of price and price-level variations as the locus of a reconstructed accounting system, are exposed. Consider his propositions that, 'Statements in monetary terms of the transactions and the relationships of the entity are one means of facilitating rational management... the derivation of such statements is a service function (p. 2)', and in respect of the '*symbols of the system*', 'no other unit is as relevant as the unit of domestic currency... [these symbols may have]... a stable real or unstable real value... the system to be devised is one which will set off against the current gross income the current costs of the services consumed... [this] differs materially from contemporary accounting practice, but stems directly from the assumptions of rationality and relevance' (pp. 4–5). The die was cast.

In contrast, the prevailing 1950s literature pursued a style that could do little other than entrench a perception that has continued to the present, that the impact of inflation on business was a 'special case', a business phenomenon 'extraordinary', rather than merely part of the monetary facet of business affairs that should be captured in the ordinary course of the accounting mechanism.

Arguably, that literature evoked much of what was to come from Chambers in the 1960s, primarily hostile to its thesis, and in the 1970s during which the ideas promoted in the 1950s literature enjoyed a resurrection. Prominent hardback literature in that decade included the U.K.'s Institute of Cost and Works Accountants' *Accounting in Relation to Changes in the Purchasing Power of Money* (ICAEW, 1952), Mathews and Grant's *Inflation and Company Finance* (1958) and Wilk's *Accounting for Inflation* (1960). But of course they appeared before a backdrop of significant contributions in the journal literature. Interestingly, contributions from the U.S. at that time shared a focus with the development of the forerunners of the current accounting standards, the Accounting Principles Bulletins, and the progenitors of the conceptual framework exercises in the form of, for example, the AIA's *Restatement and Revision of Accounting Research Bulletins* (ARB 43, 1953) and the AAA's *Accounting and Reporting Standards for Corporate Financial Statements* (revision, 1957). It is to be noticed also that most of the inflation accounting debate proceeded at that time without interjection from Chambers after his initial gambit in the late 1940s and early 1950s. Elsewhere (Chambers, 1965b), it has been explained that he had deliberately lain low while sorting his wider program for an entire reconstruction of accounting, examining in particular the nature of measurement and the development of ideas through enquiry and observation, matters which he perceived insightfully to lie at the centre of the ineptitude that had led to accounting being structured as it was. Measurement, monetary measurement in particular, occupied him in the context of the application of arithmetical rules to financial data—matters that he had tinkered with in those earlier papers. These were matters that he had to resolve before entering the debate. Although no more so than the others delving into the inflation accounting problem, he was too unprepared to proceed further in the debate. The difference was that he realised it; they did not!

Thus Chambers applied himself to higher order fundamentals that had to be resolved as a priority, rather than engaging in knee-jerk reactions and promoting instant recipes to rectify the pressures accountants and business people were grappling with. It may well be argued that as a consequence he was insulated from the contagion of the pervading focus of the day—the use of replacement prices for physical asset valuation, cost accumulation and depreciation calculations—as the means of reducing the effective tax rates. In retrospect, that insulation was fortuitous for the development of Chambers' general theory of accounting. For the business community at large it was unfortunate, for it allowed the injection of the replacement price theme to a point that it had an established take-off ramp in the 1970s.

In the tax crisis of the time it is understandable that Lacey's study (1952) was as convincing as it was, for his study of the relationship between inflation-adjusted accounts of British companies at the time and their effective taxation rates justified the claims of those who had argued unsuccessfully for taxation concessions based on like calculations. Likewise the Institute of Cost and Works' study, though neither necessarily provided a cogent reason why accounting should be reconstructed permanently. Mathews and Grant (1958) pursued a similar line of thought. Thus, while the place of replacement price in the scheme of things may have been further entrenched, so was the idea that supplementary data ought to be the mechanism by which conventional accounts should be modified. Conventional historical cost, though under attack for taxation purposes, was left virtually unscathed as the primary underpinning of accounting. The broader focus on reconstructing accounting does not appear to have been part of those authors' thinking.

Predictably, when the inflation subsided so did the interest in inflation accounting (Mumford, 1979). That interest in inflation accounting subsided at that time as it did at later times is indicative of how the problem was generally perceived and attacked as a one-off aberration in what was otherwise a satisfactory mechanism. In contradicting that, Chambers clearly was at odds with the pervading view.

Even so, that such a view prevailed against some of the background of thirty-odd years in which the issue had arisen in one guise or another is curious. Clearly the German *Betriebswirtschaftslehre* and the Dutch *Bedrijfseconomie* schools of thought, primarily the focus of Schmalenbach, Mahlberg and Schmidt on the one hand, and Limperg and his followers on the other, were pursuing a general (holistic) theory of business economics in which the effects of price and price-level changes were simply part of the complex of business phenomena. We know from both Chambers' writings and from his correspondence files (described in Dean, 2000) that he was aware very early in his academic career of the general thrust of those scholars' works. We also know that later, during the early 1960s, he engaged his research assistant Dorothy Simons, who spoke fluent Dutch and German, in translating accounting literature in those languages. Some in Italian was also translated. So we might conjecture that he possibly was also aware of the somewhat equivalent

Economia Aziendale movement of the late 1930s. We know that Chambers was a member of two Italian professional associations, *Accademia Italiana di Economia Aziendale* (1980–99) and *Societa Italiana di Storia della Ragionera* (1997–99). We have confirmation from Wells (2000) that Chambers intended to publish as much of the relevant European literature as possible in the new journal, *Abacus*.

It also is reasonable, though likewise a speculation, to imagine that he also was aware early in his career of the excursions into the price variation problem of Paton (1922), with his exposition there of the merits of replacement price based depreciation calculations, and of MacNeal's (1939) exposition of the futility of attention to historical costs rather than to current prices. By virtue of explicit reference we know that he was more than familiar with Sweeney's appropriation of the German solution during the hyperinflation.

It would be mere speculation to suggest that the idea of developing a general theory of accounting was in Chambers' mind, or there because of the influence of the European experimentation with reconstructing accounting within the context of a more holistic theory of business economics. But it is by far less so to imagine a strong subliminal influence. Those of us who enjoyed his tutelage and worked with him cannot but be aware of how he filtered virtually everything he came in contact with in respect of business in general and accounting in particular, such that his final product was in effect a distillation of everything he had ever observed, read about or had otherwise been exposed to up to that time. In this respect his ideas were never final, never refined in the ultimate, but were the latest in his continuous quest for completion. That is how it was for him during the 1950s when he took time out to fit together the mosaic of business elements, as he perceived them at the time, sift through the abundant literatures and emerge with a coherent set of related propositions as the foundation for what was to come (see Foreword to his 1980 Scholars edition of *Accounting, Evaluation and Economic Behavior* and his 'An Academic Apprenticeship', 1991). In that, how the impact of price and price level variations on the financial affairs of business were to be captured and reported in financial statements was merely part, though a necessary part, of the overall focus.

Nonetheless, during the 1950s others were engaging in the price variation debate, though primarily as part of the general battle for special pleading concessional treatment for taxation purposes.

In the U.S. the case for LIFO inventory valuations that had prewar origins bore fruit in 1949 when the Inland Revenue accepted LIFO valuations provided they were used in the official accounting statements of those companies using them for tax purposes. That outcome exposed the separation of the tax and general accounting focus, for the LIFO *quid pro quo* was less than readily embraced (McNair and Hersum, 1952). In the U.K. there were the outpourings from the Millard Tucker Committee (1948–52) and the subsequent Royal Commission (1952–55) rejecting depreciation concessions based on replacement prices; likewise the ICAEW's endorsement of that outcome in its suggestion that a 'reserving' mechanism might be employed to provide funds for replacement at inflated prices (*Recommendation XII*, 1949 and *XV*, 1952). Arguably, the overall impact popularised the case for the injection of replacement prices in accounting calculations of income, not only for taxation but potentially for general accounting purposes.

In this way the slippage from the taxation case into the more general case of adjusting accounts to capture the impact of inflation was more by accident than by design. This was boosted by the more substantial and less professionally oriented contributions that canvassed the problems of income measurement: the AIA's *Five Monographs on Business Income* (1950) was a case in point. Lacey's (1952) reconstruction of income data for British companies illustrated the taxation of fictitious income data in support of the taxation lobby; it appeared under a title that gave the appearance of a more general application—*Profit Measurement and Price Changes* (1952). So did Mathews and Grant's *Inflation and Company Finance* (1958) in respect of Australian companies. McNair and Hersum's *The Retail Inventory Method and LIFO* (1952) and Grant and Norton's *Depreciation* (1955), addressing specific facets of accounting under historical cost within that inflationary period, channelled the drift into the more general external financial reporting context.

Similar matters were also being addressed in the journal literature. Norris' 'Profit: Accounting Theory and Economics' (1945) had somewhat set the scene for the British taxation lobby, against the backdrop of Hicks' foray into *ex ante* income calculations in *Value and Capital* (1939). And contributions such as Grant's 1943 exposure of fundamental aspects of the depreciation problem being reproduced in Solomons' *Studies in Cost Analysis* (1952) and Bowers' objection to index number accounting (1952) surrounded Alexander's case for income measurement in a dynamic economy (1950). In that environment lobbying, with only sporadic academic reasoning, the special pleading for replacement price based depreciation drew little support from either the taxation authorities (in the U.K., U.S.A. or in Australia) or the accounting profession.

In a peculiar twist, the weight of academic and professional focus changed. Now it was towards methods to scale financial statement data with price-level index numbers to have the data expressed in constant (dollar) terms. Middleditch (1918), Paton (1920 and 1922), and Sweeney (1927 through 1936) had well publicized those mechanisms prior to World War II against the background of the German experience. Perhaps it was not surprising that support for them would gather momentum in the similar (though nowhere as dramatic or as economically devastating) postwar inflationary conditions of the 1950s.

No doubt the AIA-sponsored Study Group on Business Income reporting in 1952 that accounting for 'units of equal purchasing power [would be] widely useful' (p. 101) carried considerable weight. Although there were dissenting views as to whether the mechanism produced data indicative of a gain or loss of general purchasing power, the indexation of accounts received considerable support. Indexation also received considerable exposure as a viable mechanism at the profession's 1952 International Congress in London—'Fluctuating Price Levels in Relation to Accounts' was high on the agenda with widely drawn contributions—from the U.S.A., Germany, Australia and South Africa. Bearing in mind the usual lead time to the presentation at such conferences, it is reasonable to presume that the ideas presented had a gestation period that stretched back to the turn of the decade, thus indicating that the indexation method (even if on the back burner) had been simmering, while the more brash and the more desperate for a solution had pushed the replacement price theme to achieve taxation concessions.

During the 1950s the indexation mechanism received considerable exposure and featured in experimentation. It had already received a veiled approval in the ICAEW's *Recommendation XII* (1949), perhaps foreshadowing the institute's subsequent rejection of the replacement price tax case. *Recommendation XV* (1952) exhorted experimentation with mechanisms 'measuring changes in the purchasing power of money' (para. 20). Likewise, across the Atlantic the 1948 revision of the American Accounting Association's *Concepts and Standards Underlying Corporate Financial Statements* posited the potential aid that might accrue from considering the variations in the purchasing power of money. Supplementary statements presenting the effects of the fluctuating dollar were sported in its Supplementary Statement No. 2 (1951). It encouraged experimentation with the mechanism. In many respects the climate for change was favourable.

Jones' 1955 study of *Price Level Changes and Financial Statements: Case Studies of Four Companies* (1955) and his *Effects of Price Level Changes on Business Income, Capital and Taxes* (1956) further illustrated the merits of the mechanism he had explored earlier in his 'Effects of Inflation on Capital and Profits: The Record of Nine Steel Companies' (1949). In a similar manner the impact on specific companies was being pursued elsewhere. In the reconstruction of the accounts of Jantzen (Australia), Chambers had joined with practitioners to show that the financial statements scaled to the average value of the pound for the year revealed the potential for the taxation of fictitious profits, though he became embroiled in disputation with the team members regarding how the results should be interpreted: 'the full implications were not understood ... I resolved therefore to take no further part in what had become known as the price level debate' (Chambers, 1969).

A noticeable feature of the positioning of both the supporters of replacement price valuations and those in favour of the indexation method is that little distinction was drawn between the two on the grounds that one or the other better captured the impact that rising price levels were having on accounts. Reading the literature with the benefit of hindsight gives the impression that the protagonists perceived little difference between the methods, viewed them as harmonious alternatives. There was virtually no discussion of the nature, function, basic characteristics and fundamental dimensions of money; no direct discussion of price changes and changes in price structures. Whereas it might have a subliminal theme, nor was there any direct examination of the functions of financial statements, the nature of financial position and the like. Attention was on how the reported numbers might affect the taxation system. Most importantly, there was little that could be taken to be a criticism of the pervading historical cost system. It was as if it was fundamentally sound and as if the data it produced incurred distortion by virtue of the inflation aberration. Without inflation, historical cost appears to have enjoyed absolute opprobrium. Those examining the aberration were travelling a well-worn intellectual groove.

EXITING INTELLECTUAL GROOVES

Chambers exited those grooves (1965b); *Towards a General Theory of Accounting* (1962a) and *Resolutions of Some Paradoxes in Accounting* (1962b) rehearsed his concern with the manner in which accounting problems were being tackled. Rejection of many of the fundamental propositions of conventional accounting, the necessary supposition of a *stable monetary unit* and the pervading use of historical cost was inevitable.

Arguably, his exit from intellectual grooves was a watershed in Chambers' thinking. There he appears to have seen clearly that the problem did not lie with inflation *per se*, but with price and price-level variations which were an integral part of the commercial reality. Further, price and price-level variations fuelled commerce, were the very means by which it proceeded, underpinned every facet of commercial activity and gave money its pivotal role in society. Financial statements of necessity should capture the impact of all price and price-level changes if they are reliably to show the financial outcome of business activity.

Here Chambers was to strike a chord that separated him from his contemporaries. His propositions drew upon his observations of everyday commerce around him. Financial statements as they were currently prepared—in accord with the historical cost system—conflicted extensively with what he observed of the financial characteristics of business affairs. So did the fundamental propositions upon which they rested. It was not so much that the current period was peculiar in its experience of changing prices and price levels; indeed that was the prevailing condition in monetary economies. It was no more a problem of inflation than it was of deflation, or indeed of periods of stable price levels. Supposition and proclamation of a stable monetary unit as a principle of accounting had no empirical support. Casual observation showed that.

Chambers' exit from the grooves in which he perceived the entire focus on inflation accounting was moving and the publication of *Accounting, Evaluation and Economic Behavior* (*AE&EB*; 1966a) are juxtaposed with the appearance of Edwards and Bell's eventual capitulation to convention and support for the valuation of assets at their entry prices in *The Theory and Measurement of Business Income* (1961), and the AICPA's case for the indexing mechanism in their research study, *Reporting the Effects of Price-Level Changes* (1963). *AE&EB* was virtually completed when the 1965 intellectual grooves paper was written. It thus had the benefit of what were effectively the latest arguments of both those promoting replacement price and those pursuing the indexation mechanism upon which to draw and against which to benchmark. Chambers' exit from the grooves was thus a kind of penultimate broadside at those whose focus was the inflation accounting problem. *AE&EB* was the final king-hit—the distillation of observation and thought over the best part of a decade from his initial gambit in 'Blueprint for a Theory' (1955).

By 1965 Chambers was convinced that many of his colleagues laboured under the set of unjustifiable, unsupportable and empirically naked presuppositions underpinning the conventional historical cost system. To him, it appeared that they were unwilling or unable to break free from the well-worn grooves of historical cost—'convenient, and easy, but uneconomical of the resources of those one serves' (1965b, p. 249). First was the failure on their part to 'examine as completely as possible the value of all old ideas'. Old ideas that contradicted the new observations had to be discarded. Not the least of which were the perception that appeared to underpin most of what had been written on the inflation accounting problem, that 'the cost principle is valid'; the notion that averaging index movements could somehow provide serviceable coefficients by which to scale the actual data into common or constant dollar terms; and the prevailing juxtaposition in proposals of historical cost and replacement price for the valuation of non-monetary assets (pp. 249–51).

Allegiance to the cost principle was implied clearly by the push for indexed data to be supplementary, a policy pursued in ARS 6 (AICPA, 1963). It also could be implied by Edwards and Bell eventually opting for entry price valuations when they had argued so strongly for exit price valuations—the opportunity costs—earlier in their text, primarily on the grounds that it was less offensive to conventional and current practice. No defence could be entered for that unless accompanied by a belief that current practice was acceptable under ordinary circumstances. Rehearsing what was to come in *AE&EB*, Chambers declared in typical punchy style:

> No one who wishes to improve his position pays any serious attention to the cost of what he wishes to sell. If he judges he will be better off, he will sell; what is paid is paid, there is nothing he can do about it . . . the same applies to use . . . [the sacrifice] in using a good is not what it cost, but the amount of money he could get for it (and directly, therefore, the best alternative use to which he could put that money) . . . What was paid for it is irrelevant . . . In short, in no practical, forward-looking, decision-making situation is a past cost relevant. (1965b, pp. 249–50)

Use of the terms 'constant dollar' and 'common dollar' in ARS 6 (p. 29) and in other expositions of similar indexation mechanisms were also consistent with a recognition of the cost principle, for invariably the notions were used to explain how the conventional historical cost data could be scaled to represent dollar amounts in base years. Likewise they were used to scale the historical cost data for revenues and expenses by averaging the movements in the price-level index to obtain common dollar aggregates of the purchasing power implied by the historical cost data.

Whether Edwards and Bell's retreat to entry price valuation for physical assets was the result of 'following a well-worn groove' (Chambers, 1965b, p. 251) was used as the peg upon which to hang heavy criticism: rehearsing the notion of general relevance embedded in the logic of his *AE&EB* thesis, and reinforced later in his (1976d) *Accounting Review* response to Demski (1973). 'What a firm has', Chambers notes, 'it does not necessarily have to replace . . . if it wants something else . . . always relevant . . . is the amount of money it can get for what it has . . . the opportunity cost ("exit price") of what it has.' And although entry price may approximate 'the order of magnitude of opportunity cost . . . that does not make it ideal in principle' (p. 251).

At the root of the problem was that new insights were potentially crippled if their promoters were caught in the conventional grooves. 'We have to *think our-*

selves out of the definitional constraints of old methods' Chambers exhorted with a final message: 'Willingness to work within the strictures of the intellectual grooves we have found comfortable for so long will not bring relief on a satisfying scale from the defects of traditional methods' (1976d, p. 252).

A TASTE OF CoCoA

Bedrock for those strong views on 'inflation accounting' unquestionably lay in the preparation for the complete reconstruction of accounting in *Accounting, Evaluation and Economic Behavior* (1966a). Price and price-level variations were captured in the system in which transaction data were to be stated in the terms in which they arose, physical assets (with the exception on short-term inventories) were to be stated in the balance sheet at their current cash equivalents (best approximated by the current selling prices), periodic variations in cash equivalents were to be brought into the income account, and the capital maintenance adjustment brought to account for any necessary amount to scale the amount of the 'net assets' at the period's beginning to an amount entailing equivalent general purchasing power at period's end. Thus, within the structure of Continuously Contemporary Accounting all the effects of price and price-level variations were brought into account in three sets of adjustments. These captured (a) all the variations in the specific prices of the firm's assets accounted for either in the sales revenue or the proceeds of sale of long-term physical assets, (b) the change in the money's worth of the physical assets still possessed, and (c) the change in the general level of prices through the capital maintenance adjustment. The capital maintenance adjustment (inter alia) definitely brought into income account adjustments for the dimensional differences of the revenue and expense data, and offset any portion of a change in the money's worth of the physical assets reported as 'asset price variations' represented solely by the change in the general level of prices.

It is noticeable that Chambers had fallen prey to an intellectual groove himself—in deference to 'the lower of cost, net realizable value or replacement price' dictum (as it then was) through the retention of replacement price valuation for some short-term inventories. But, true to form, when that inconsistent (and unnecessary) aberration was pointed out to him he quickly admitted to his own fragility in the face of entrenched ideas and declared in his 'Second Thoughts' (1970b) that the current cash equivalent of the inventories was to be approximated also by recourse to current selling prices. Ever the perfectionist, further refinements were made in his 'Third Thoughts' (1974).

CCA (as his acronym for Continuously Contemporary Accounting was then) ran counter to the prevailing focus on supplementary data. It also contradicted the idea that the various components of price and price-level variations had to be teased out and reported separately as did, for example, Edwards and Bell's schema of business income, realized cost savings, realizable cost savings and holding gains. While Chambers concurred with the general range of matters that affected business as depicted by Edwards and Bell, he (1966, 1982) saw little that was understandable from the range of financial ephemera they posited. It ran foul also of the general indexation mechanism inherited from the Sweeney exposition and reproduced religiously thereafter in which transaction data had to be scaled to (generally mid-year average) 'common dollar' magnitudes. That disposed with one shot the averaging problem that he had attacked. It also did away with the necessity to provide a label for the balance of the indexation adjustments, invariably taken to be the 'gain or loss of general purchasing power on monetary items'—the supposed gain or loss 'from inflation' (Clarke, 1975). It also disposed of the counter-factual presumption that underpinned the indexation method that the change in the specific prices of the separate assets equalled the change in the general level of prices—that all prices moved uniformly.

Patently that was contrary to all experience over time in respect of the behaviour of prices as part of dynamic price structures and the exploitation of the variant movements therein, as so aptly described and illustrated in Bresciani-Turroni's (1931) coverage of the creation and dissipation of different parties' wealths during the post-World War I hyperinflation; a theme repeated in Guttman and Meehan's *The Great Inflation* (1975) and Holtfrerich's *The German Inflation, 1914–1923* (1986). Chambers' CCA captured the overall gain or loss in general purchasing power without recourse to the fiction that the gain or loss on monetary items was somehow unrelated to the gain or loss on non-monetary items—that the former were not part of the operations that involved trading, while those giving rise to the latter were. The separation of the two was not only impossible, it also was counter-factual. Indeed, CCA somewhat disposed of the idea that for financial purposes the monetary/non-monetary dichotomy served any purpose, for it reduced (as accounting necessitated) all to their monetary—their general purchasing power—significance. In accounting, the distinction between monetary and non-monetary items serves little purpose in financial tabulation and calculation, though it is clearly a matter to note in respect to assessments of liquidity, and useful for the description and evaluation of general purchasing power at risk.

It will be recalled that Chambers had retreated from his affinity with the indexation method and moved towards replacement price as the basis for physical asset valuation in *Towards a General Theory* (1962a) and in turn had found that inconsistent with his enquiry into monetary measurement in 'Measurement in Accounting' (1965a). Against that backdrop, ARS 6 and Edwards and Bell's *The Theory and Measurement of Business Income* came under attack. Insouciant mechanisms for separating gains and losses on monetary items from gains and losses on other trading came in for harsh but justified treatment in the jousts with Moonitz in 'A Study of a Price Level Study' (1966b) and 'A Study of a Study of a Price Level Study' (1967a) and with Mathews in 'Price Variation Accounting—an Improved Representation' (1967b). Rejection of the opportunity cost basis by Edwards and Bell was savaged in 'Edwards and Bell on Business Income' (1965c), with allusions to what was to come in *AE&EB* the following year. Analysis and explanation of the entire range of the 'elements of price variation accounting', including the potential for injecting net-present values to simulate economic income of the Palle Hansen (1962) variety, appeared in *The Accountant* (1970a), using common data in the examples to drive home the superiority and simplicity of CCA.

Again, the timing was interesting—the ICAEW's *Accounting for Stewardship During a Period of Inflation* had appeared in 1968, a discussion paper *Inflation and Accounts* (1971) was about to pave the way for the release of the first British exposure draft on the matter (ED 8, 1973), with the earlier ICAEW *Recommendations XII* and *XV* and the taxation lobby outcomes in the background. In the U.S.A. against, for example, the Jones (1949, 1955, 1956) studies using the indexation method, ARS 6 had received the imprimatur of Sweeney in his preface to its issue in 1963. APB 3 in 1969 had revived interest in the indexation method. And of course there remained considerable euphoria regarding the Edwards and Bell thesis.

It was no surprise that ED 8, *Accounting for Changes in the Purchasing Power of Money*, received a hostile welcome in Chambers' 'Current Purchasing Power Accounting—ED 8 is Not the Answer' (1973), which repeated what he had earlier said on the indexation method. In his telling style he drew readers' attention to his prior critiques (noted in the paragraphs above): 'none of the objections [raised therein] on practical and technical grounds has been refuted'.

In keeping with being never a prophet in one's own time or own land, it was no surprise that the Australian profession issued an exposure draft similar in both style and content to ED 8. Unable to convince the Australian Society of Accountants and The Institute of Chartered Accountants in Australia that they should likewise expose his CCA proposal, Chambers predictably did the unthinkable—he published his own exposure draft *Accounting For Inflation* (1975b) and sent 3,000 copies worldwide. It is understandable that recently he explained how he felt that he was 'living on the fringe' (Chambers, 2000).

SANDILANDS' 'THEFT'?

With that kind of exposure it came as a shock when the Inflation Accounting Committee chaired by Francis Sandilands claimed the CCA nomenclature for the committee's preferred Current Cost Accounting in its report, *Inflation Accounting, Report of the Inflation Accounting Committee* (1975).[1]

Predictably, Sandilands' CCA received a through analysis in print in quick time following its publication.[2] Every facet of the report was dissected. Most importantly, the use of the notion of value to the business and the use of the Solomons matrix[3] by which deprival value mainly distilled to some form of current replacement or reproduction cost. Sandilands' recourse to the valuation rule drawn from Bonbright's *The Valuation of Property* (1937) treatise on the compensation due to those deprived of their property through compulsory acquisition or other loss understandably came under attack, for it was being applied by Sandilands in respect of property of which the business entities had not been deprived:

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[1] Those of us at the University fo Sydney at the time can recall vividly Chambers' dismay, disbelief and considerable anguish when a telephone call from Britain informed him of the primary conclusions of the Sandilands Committee—a push for current cost accounting and its being labelled CCA, notwithstanding Chambers' prior use of the term to describe his Continuously Contemporary Accounting. It was used in his submission to the committee and had been used in both general and formal comment, as for example in the title of his own exposure draft, for some ten years, he advised the Committee in his critique. He clearly considered it impossible that the expropriation by Sandilands was in ignorance of his wide usage of the label.

[2] This came through the aegis of his longstanding colleague Professor Edward Stamp, at that time head of the International Centre for Research in Accounting at the University of Lancaster. Not always the most favoured son of the establishment of the profession in England because of his outspoken critiques on conventional practice, Stamp gave Chambers the opportunity for a quick response in the form of a lengthy Occasional Paper (no. 11) *A Critique of the Sandilands Report* (ICRA, 1976a).

> the line of argument by which the Report proceeds from the Bonbright dictum is in error, both logically and practically ... It is logically fallacious to write 'NRV > PV' ... They are not in the same domain. They cannot be compared ... [or] 'PV > RC', or to any statement which expresses a relation between a fact and an expectation. (1976a, p. 42)[4]

Likewise, Sandilands' discussion and rejection of CoCoA came under particular scrutiny,[5] to Chambers' chagrin:

> The Report described COCOA as 'an interesting example of a hybrid system using "purchasing power of shareholders' equity" concept of capital maintenance and a basis for the valuation of assets other than historical cost' (510). If anything is a hybrid—produced from different species, cross-bred, mongrel, heterogeneous, according to my dictionaries—it is CCA. A hybrid such as 'value to the business' would be hard to find in the annals of accounting and more hard to find in any other quantitative discipline. The use in COCOA of one valuation rule and its adherence to observation, experienced events and mathematical integrity, make it the only pure bred system. (1976a, p. 69)

It is now history that neither the indexation methods nor Sandilands' CCA found approval with the practising arm of the British profession, as indeed was the fate of the subsequent similar proposals promoting replacement price, current cost asset valuation, with or without various indexation adjustments intended to bring into account some kind of adjustment for the changes in the general level of prices in Australia, Canada, New Zealand, and the U.S.[6] It also is history that Chambers responded to the appearance of almost each with characteristic vigour.[7]

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[3] Clarke (1982) so labelled the popular grid rating RCs, NPVs, HCs and NRVs intended to sort out a rule for asset valuation based on decision-making criteria.

[4] Not that it seems to have deterred those promoting deprival value for public sector infrastructure valuation. Past criticism of the creditability of the deprival value notion in the public sector context has indicated that Chambers' comments regarding the recourse to Bonbright's exposition of value to the owner have a curious capacity to prevail (see Walker *et al.*, 2000).

[5] It was about the time that the critique of Sandilands was being prepared that the switch from CCA to first COCOA and then CoCoA occurred. It will be noticed in the Critique COCOA is used. CoCoA was introduced when the Department of Accounting at Sydney hosted a lunch for a number of partners of the main professional accountancy firms. For devilment, match folders with the motto 'Try CoCoA' were put next to the place names (as was the habit at the time). Only twenty-five of these folders had been made up for the occasion at a downtown store. The CoCoA format was chosen because COCOA looked too much like an adverisement for a popular brand of chocolate. During the luncheon it became apparent that they thought (as with his exposure draft) thousands were around in and out of Australia promoting what the profession did not endorse. We hadn't thought of that. In short time there were.

[6] The story of the machinations of those promotions are well told in Whittington (1983) and Tweedie and Whittington (1984). Details of the chronology of the various proposals and their content is to be found in Clarke (1982).

THE CoCoA PARADOX

That each of the official proposals failed sets CoCoA's dealing with the impact of price and price-level variations on a plane by itself. It has not incurred that ignominy of the profession's rejection after official endorsement. To the contrary, the central thrust of CoCoA that various physical assets be valued at their current selling prices has found its way into the accounting standards in numerous countries. In Australia, that all physical assets be so valued was an express recommendation in the first report of the 1998 Australian Commonwealth government's Company Law and Economic Reform Program.

Paradoxically, while the others have gone in the context of accounting in the private sector,[8]—unceremoniously dumped, notwithstanding the official support they received, at least insofar as receiving sponsored exposure to the ranks of the profession—the inflation accounting aspects of CoCoA survive intact and, albeit slower than warranted, appear to be making progress.

That is justice! For Chambers practised the ethos he preached—that expressed in the quotation from Peirce at the head of this article. By his understanding of the price and price-level phenomena Chambers knew what he meant, was master of his own meaning; his thought and the expositions of it were intellectually weighty; surely a solid foundation; CoCoA contains but a few clear ideas, easily learned by those who take the time to listen.

Perhaps Chambers on the price and price-variation problem was, and remains, too complex in its simplicity for those who, no matter what lies in their best interests and indeed in the best interests of the commercial community, prefer to wallow helplessly in the rich mud of conceptions.

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[7] See, for example, Chambers (1975a, 1976b, 1976c, 1977a, 1977b, 1979a, 1979b, 1986a, 1986b).

[8] See note 2 for the position of deprival value in respect of public sector asset valuation and also Walker *et al.*, 2000.

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Chambers on Methods of Inquiry

Some of Chambers' earliest works concerned the need for intellectual rigour in accounting research. Drawing from his reading in philosophy, science, organizational behaviour and economics, he determined the principles of scientific theory, enunciated these and consciously followed these precepts in developing his own theory. His 1950s and 1960s theoretical works were seminal contributions to methodological inquiry in accounting. They sought to rectify the lack of theoretical foundation in accounting thought and the observed *ad hoc* rules of accounting practice. While annoying many, including the doyen of U.S. accounting academe, A. C. Littleton, he practised what he preached and the theory he later developed followed closely precepts that were set out in those early methodological inquiries. He was attacked by a new wave of positive researchers in the 1970s, but a closer examination reveals they share the same ontology and epistemological proclivities. Differences arise from the different assumptions and aims of their theorizing. Their methodology is hypothetico-deductivism derived from logical empiricism. This has been shown to be a defective and moribund method for developing acceptable reliable knowledge. Despite the claims of its adherents it ignores the ideological, political and social elements that make objective, value-free theorizing impossible.

Key words: Accounting; Method; Theory.

The method of inquiry pursued by many great contributors to our knowing about our world is often difficult to determine. This is especially true of those whose contribution extends over a long period of time. While this may seem a truism (or fairly obvious) it is interesting because it suggests that there is no single methodology by which knowledge is accumulated. Karl Marx is a positivist, a historicist and a critical social commentator (philosopher). Although he was an economic conservative who might not appreciate association with Marx, when considered overall, Raymond Chambers' work is equally difficult to box and label yet fits a similar pattern. Also, both were concerned with social and economic justice and sought to establish systems of understanding that would facilitate this. However, it is because they sought such ideals that, as their work developed, they became increasingly aware of the need to expand their methods of inquiry away from that which they so cherished early in their working lives. I had many a long debate on methodological issues with Chambers, but like so many others in similar situations I deeply regret not having had the opportunity to respond to him on several questions he

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posed to me before his untimely death. Perhaps it is because as the student grows older he or she feels more confident in tackling the mentor on matters of mutual concern that I thought I could finally persuade him that my approach had more potential than his.

THE PURSUIT OF RIGOUR

On entering the discipline of accounting, Chambers found what he later claimed was a field of inquiry with little theoretical foundation and *ad hoc* rules of practice lacking any intellectual rigour (e.g., 1961, para. 1). He set about rectifying this with a missionary zeal. In so doing he made a seminal contribution to methodological inquiry in accounting (1955b) but trod on many established toes, most notably those of the doyen of U.S. accounting academe, A. C. Littleton. However, he practised what he preached and the theory he later developed followed closely the precepts he set out in these early methodological inquiries. His charge of the lack of intellectual rigour in accounting remained a theme throughout his work (e.g., 1999b). Not only was it used to defend his own theory but also to counter the arguments forwarded by critics (e.g., 1993).

In his 'Blueprint for a Theory of Accounting' (1955a) he noted that most writers on accounting in the first half of the twentieth century had eschewed the term 'theory of accounting'. When they did use it 'The practice is misleading because it implies that there is nothing more fundamental in the study of accounting than formulations of practices' (p. 18). So too were the attempts to justify rules or propositions on historical grounds. While formulations of practice 'are useful' and historical studies 'interesting and informative', this was not the 'stuff' of theory. Nevertheless, consistent with the teachings of Aristotle, theory is that from which practice proceeds and, although it may be possible to build a theory of accounting without reference to practice, theory could not remain 'remote from reality' for it had to be used as the basis of practice and, what is more, had to be tested in this reality; 'there is no such thing as accounting in the abstract' (p. 19). However, the fundamental premises for a theory of accounting lay outside the field of accounting proper, and to this end Chambers suggested four propositions:

> (a) Certain organized activities are carried out by entities which exist by the will or with the co-operation of contributing parties;
> (b) These entities are managed rationally, that is, with a view to meeting the demands of the contributing parties efficiently;
> (c) Statements in monetary terms of the transactions and relationships of the entity are one means of facilitating rational management;
> (d) The derivation of such statements is a service function. (1955, p. 19)

It is worth quoting those propositions because they remained with him throughout his whole work. In his response to a review of this work by Littleton (1956) Chambers counters that none of the propositions could be denied as they were all 'statements of fact' (1957a).

Between this response to the criticism of his earlier work (1955a) and that work (1957a) Chambers published an explication of the former work. This was published in a professional (i.e., not academic) journal and entitled 'A Scientific Pattern for Accounting Theory' (1955b). So too was another article, 'The Conditions of Research in Accounting' (1960). This is notable because the works were very different from what had appeared in the accounting literature to that time. They were works with strong philosophical argument and certainly not the sort of works that are found in current professional accounting journals. No doubt this was partly due to the fact that there were few academic accounting journals, but it also indicates a greater closeness between the practising and academic arms of the profession. It is also significant in that it indicates that Chambers was concerned with what he perceived to be the very fundamental basis of accounting practice.

These works were extended in a major paper, *Towards a General Theory of Accounting* (1961). This paper became the basis for the theoretical exposition in his magnum opus, *Accounting, Evaluation and Economic Behavior (AE&EB*; 1966).

METHODOLOGY

Chambers disliked being 'boxed' or 'labelled', yet in his pursuit of theoretical rigour his methodological predilections are clear. Constant allusions to 'facts' and conforming to 'reality' indicate a realist ontology. Epistemologically, the methods of science were those in which intellectually rigorous standards lay. While Littleton (1956) claimed to be a pragmatist and argued against the appropriation of scientific methods for the study of accounting, Chambers vehemently opposed such a view. In fact, Littleton's claims for pragmatism were more an apology for the low intellectual status of accounting rather than maintaining the great line of American pragmatic philosophers from Dewey to Rorty. Littleton claimed that accounting was a practical affair relating to everyday business activity and did not warrant the pursuit of such lofty goals as the methods of science. To Chambers, the sorry state of accounting thought was because too many held attitudes such as Littleton's: he was intellectually ambitious and the titles of his papers, addresses and other works suggest this. For example 'Towards a General Theory of Accounting' (1961) is obviously an allusion to a similarly titled work in economics!

The methods of science espoused by Chambers were conventionalist. They were based in the hypothetico-deductive tradition of the logical empiricists. This is acknowledged when he states that his principal formal guides included Cohen and Nagel's *Introduction to Logic and Scientific Method* and Larrabee's *Reliable Knowledge* (Chambers, 1974a, p. xi). The process of theory constructions commences with axioms and assumptions which form the basis of propositions which are then subjected to testing. The theory is constructed from *a priori* and *a posteriori* premises (axioms or percepts). From these, propositions or hypotheses are deductively derived, being ordered hierarchically in terms of complexity and dependence on prior arguments. These are sometimes referred to as the theorems which form the final theory. Hypotheses are to be subjected to rigorous testing: 'in fact, one of the greatest pleasures of the theorist [is] to put his hypotheses to the test of reality' (1955a, p. 19).

Chambers was faithful to this process from his 'Blueprint' article to the full (first) exposition of his theory of continuously contemporary accounting in *AE&EB* and many subsequent attempts to win its acceptance.

METHODOLOGICAL REJECTION

There is little doubt (and no evidence to suggest otherwise) that Chambers was the first in the English accounting literature to fully explicate such a rigorous scientific method and then consciously employ it in developing a theory. His seminal contributions to the debate on rigorous methodology in accounting are probably well accepted. His papers spawned many others, from critics to supporters, from fellow commentators to sceptics. The literature abounded with methodological discussions, a body of research that 'clearly increased the rigor of the academic theoretical debate' (Previts and Merino, 1998, p. 310). There was a surge in support for the adoption of scientific methods in accounting research in the work of many. While supporting this thrust, some urged caution (e.g., Devine, 1960; Mattessich, 1984), but there seemed a general acceptance of the notion that research employing scientific methods would provide a solid foundation for the practice of accounting and the establishment of sound generally accepted principles (see, e.g., Sterling, 1979).

However, in the 1970s there was a major shift in the common perception of what was in fact scientific. Accounting researchers were now trained in the research methods of other social sciences and had the use of computers to assist in handling large-scale data. Accounting writers earlier in the century had sought to standardize accounting on the basis of what could be regarded as best practice. Gilman, Sanders, Hatfield and Moore, Littleton and others had looked to practice to determine a 'theory' of accounting. The new order sought to resurrect this method of inquiry but in a much more sophisticated and systematic manner; positive accounting was born and with it 'the true scientific method' (Watts and Zimmerman, 1986, p. 14). The 'new' researchers dismissed the previous research as being normative, that is, prescriptive and abstract. Their research would determine theories on the basis of describing what existed. With the growth of positive accounting research, any attempts to make accounting an intellectually independent discipline died. The new researchers approached their work confident that they had finally arrived at the most appropriate method for establishing accounting theory. However, in their enthusiasm they failed to note that they were adopting a moribund epistemology. They ignored their critics who ranged from the methodologically conservative (Christenson, 1983; Sterling, 1990) to the 'moderate' (Boland and Gordon, 1992) to the more radical (Tinker and Puxty, 1994).

Chambers found the rejection of what he had argued for extremely frustrating. Debate between the so-called normativists was at times quite bitter, yet the protagonists respected the right of the others to argue for a different position. The 'new researchers' appeared to be quite dismissive and disdainful of any views different from theirs. Thus, Christenson's blistering attack on their work on the basis of their own position—an empirical methodology based on logical positivist and Popperian argument—went almost unanswered. To Christenson, not only was positive accounting untenable epistemologically and methodologically and based on a defunct philosophy, it was incorrectly named. Its self-proclaimed progenitors were unperturbed. Positive research, it was claimed, 'is the application of the research paradigm (under philosophy and methodology) of the sciences to investigate accounting phenomena' (Watts, 1995, p. 297).

Watts (1995) has suggested associated reasons for the move towards positive accounting. These include greater training in 'underlying disciplines' (p. 299), the belief that 'good' accounting research needed hypothesis forming and testing, the increased use of computers and machine readable databases and the founding of the *Journal of Accounting Research* (see Wells, 2000). Methodologically, Watts argues that the so-called normativists had incorrect and inconsistent assumptions, most especially in respect of capital markets and the lack of systematic evidence to support their assumptions.

The underlying disciplines seemed to mean economics and finance. Finance researchers were quick to appreciate the methods of economists and the new availability of data and developed various hypotheses. Positive accountants, in turn, learned from these financial economists. Economics has a long history. The economics that served as the model for positive accounting was, of course, Chicago-style neoclassical economics with its unswerving allegiance to a free and unregulated economy—the market is the ultimate arbiter. Chicago-style neoclassical economics is an ideology which has been exposed to sustained attacks from those working in a great number of disciplines, including accounting (e.g., Tinker, Merino and Niemark, 1982). Many social ills have been ascribed to an uncritical belief in Chicago-style neoclassical economics by politicians (e.g., see Pusey, 1991). A cursory glance at the history of economics will clearly show that markets have their incipience in state regulation and policy. Once established, they have always needed continued state intervention (see, e.g., Hetherington, 1996).

Watts claims that accountants, prior to the positive type, were untrained as social scientists. There is much expressed in such a sentiment. First, it acknowledges accounting as a social science, and secondly it accepts certain methodologies are appropriate to accounting research. There is little doubt that accounting is a socially constructed business information system. It ignores the considerable methodological uncertainty in the social sciences and accepts the then conventional instrumentalist large-scale data techniques of naïve empiricism commonly employed in economics. Thus, an assumption that accounting should reflect financial markets made it possible to access large databases which could be analysed with the assistance of computers: accounting research became closely associated with stockmarket prices—capital markets accounting research 'came of age'. However, if accounting is to be analysed as a social science then there should be some recognition that there are weaknesses in empiricism as a basis for comprehending the world (e.g., see Feyerabend, 1965). Positive (capital markets) accounting researchers only looked to economics for its methodological presuppositions. Later, behavioural researchers looked to experimental psychology with equally blinkered vision.

As noted, the founding of the *Journal of Accounting Research* is discussed elsewhere (Wells, 2000). It would seem that, initially, it was not a simple device for promoting positive research that Watts suggests. However, he quotes the study by Dyckman and Zeff to show that 'empirical papers as a proportion of papers published in JAR rose from 13 per cent in 1967 to 31 per cent in 1968 to 60 per cent by 1972' (Dyckman and Zeff in Watts, 1995, p. 303). 'Normative' papers fell from 24 per cent in 1967 to zero by 1972. This was a conscious policy by the then editor Nicholas Dopuch, who, in an editorial statement, indicated he would not consider publishing non-empirical papers. This same editor towards the end of his tenure admitted that the empirical research which he had been so keen to sponsor had proved as fruitless in influencing accounting practice as had the previous research he had denied access to the journal (Dopuch, 1979). However, subsequent editors seem to have accepted an even stricter policy and this has also spread to *The Accounting Review*, which purports to represent the interests of the members of the American Accounting Association (see Tinker and Puxty, 1994, for some illustrations of editorial 'policy').

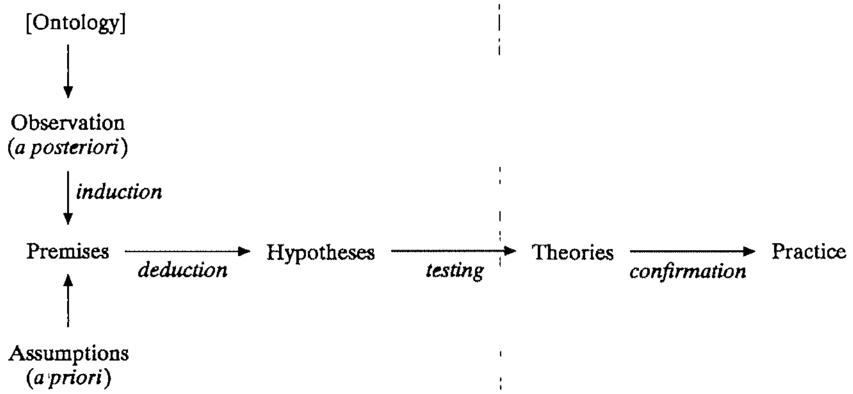
SO, WHAT WAS WRONG WITH CHAMBERS' METHODOLOGY?

It is interesting to compare the scientific method of Chambers with that of the positive researchers. As discussed above, Watts has made several claims as to why the research methodology that Chambers espoused was defective. A disinterested methodologist is unlikely to perceive the great differences Watts claims.

Figure 1 presents a (greatly simplified) schematic of the scientific method. Comparing the methodology of Chambers with that of the positive researcher, it would seem that there is only a difference in emphasis. That is, both are premised on the same epistemological principles. The claims made by Watts and many others that Chambers' work is not empirical are untenable. The most significant differences lie in the assumptions (as Watts has suggested), the extent of the use of those

FIGURE 1

THE SCIENTIFIC METHOD



assumptions and the type of testing. Thus, the differences are mainly in method not methodology (but lead to very different conclusions).

There are many minor variations in what is described as the scientific method, but generally speaking it has roots in the post-Enlightenment vision of science being the basis of humankind's understanding, explanation and control of (natural) phenomena. It relies on an assumption of the possibility of objective knowledge, reductionism and mathematics. It is rooted in a realist ontology. If it is to be employed in the social disciplines then, presumably, it has the same function with a few complications arising from the fact that social phenomena are not so constant as natural phenomena are believed to be. Economists have long claimed scientific status but have for some time now realized the futility of this (e.g., see Latsis, 1976; Katouzian, 1980; Boland, 1982; McCloskey, 1983, etc.), yet positive accounting researchers have lurched headlong into the blind acceptance of the older belief.

As indicated above, Chambers consciously attempted to bring scientific rigour to accounting research. While the positive researchers tended to accept economic (and finance) methodology as being scientifically rigorous, Chambers read widely in philosophy, organizational behaviour, science and other relevant disciplines to determine the method. Through this he developed a sound understanding of what was required of a theory for it to be labelled scientific. The positive researchers have attracted considerable criticism as to their understanding, or lack thereof, of philosophy of science (e.g., Tinker *et al.*, 1982; Christenson, 1983; Boland and Gordon, 1992, and many more). There has been very little criticism of Chambers' understanding of the subject. Most of the criticism Chambers' work attracted concerned his assumptions and some of his method (namely, measurement).

The positive researchers have criticized Chambers (as representative of the so-called normativists) as being non-empirical. Understandably, Chambers found this charge to be totally preposterous. Empirical means the subject of sensory experience. In relation to theory development, this is mostly observation. He had been at pains to show that the *raison d'être* for his work stemmed from what he had observed while working in the pricing tribunal and what he saw in corporate financial reporting. In fact his work, *The Function and Design of Company Annual Reports* (1955c), was one of his earliest major publications. The title of another, *Accounting in Action* (1957b), seems to belie the charge of non-empirical. Yet another work, *Securities and Obscurities: A Case for the Reform of the Law of Company Accounts* (1973), was the observational basis for his theoretical work. Thus, there would seem to be some misunderstanding about what comprises empirical work. Positive researchers claim to describe 'what is' and are thus equally empirical. Watts claimed that the new research was made possible by the low-cost access to large-scale databases and computers. Obviously, therefore, the 'observations' of positive researchers are likely to be more systematic and probably involve many more observational instances. However, this does not make work unlike that any less empirical.

If positive researchers restrict their observations to stock market databases then there are obvious implications. First, it could be argued that it is less wide ranging, only concentrating on a narrow range of observational classes. This then redefines what accounting is. That is, accounting is perceived as being solely for investors in stockmarket quoted securities as all other 'reactions' are ignored. As such it reinforces an economic ideology: that of the market and most especially financial securities markets. Thus, the accounting that Chambers envisaged was very different from that of the positive researchers, so it is little wonder they arrived at different conclusions. Chambers, like all the standard setters to that time, was concerned with the usefulness of general-purpose financial statements. Watts' claim that the normativists were incorrect in assuming who users were is unsustainable—they were just (very) different from those whom he defined as users of accounting information. The stockmarket was always going to rely on information other than financial statements, so their conclusions are not that startling. But they are silent as to other users. Chambers (1974b) exposed this deficiency.

Researchers employing the scientific method start by recognizing or defining a 'problem' which they seek to solve. To capital markets researchers this would involve determining some market response to an event. The observations sought by such a researcher, therefore, are likely to be clearly defined. They are defined in terms of securities market reactions. All other potential users of financial information would not be considered (obviously). On the other hand, a researcher concerned with general-purpose financial statements would have to consider a wider range of observations. Which is the more empirical? Thus, both positive researchers and Chambers are reliant on the *a posteriori*, observations from which they make inductions. The former will restrict their observations to a narrow field and make use of computer tapes; the latter will attempt to observe as widely as possible. There are many other examples of the latter by other researchers, such as Briloff (1976), Niemark (1992), and Clarke, Dean and Oliver (1997), to name a few.

Chambers also relied on economic theory. Once again, his reliance was more widely based than that of one school. Although he did make use of notions of von Mises he also had recourse to many other economics scholars. Once again, by relying on one school of economics, the economic assumptions of the positive researchers are reinforcing an economic ideology. Chambers took a much wider view of what the fundamental 'economic problems' were. Both accept a free market ideology as well as notions of economic rationality. In fact they are very strong elements of both types of research (recall the propositions Chambers had in his 'Blueprint' paper noted above). Chambers' assumptions are more wide-ranging than those of positive researchers and this is the cause of the more obvious disagreement. Most of Chambers' assumptions are explicated in a later work (1991). Entitled *Foundations of Accounting*, it sets out clearly what he sees as the basis for the uses of accounting from the setting of its boundaries to the commercial, legal, economic, communicative, behavioural and many other bases ('foundations') of accounting information.

Positive research also has assumptions on which it relies, and these are those of Chicago-style neoclassical economics. They are narrow and restrictive (and the cause of much of the criticism it attracts from many varied social sources; for example, see Pusey, 1991) and have been discussed and debated in many places. Their assumptions mean that the function of accounting is seen to be very different. Even so, some of the claims made by many positive researchers have been shown to be not very novel. For example, Chambers (1993) argues that he had written about the firm in agency terms long before positive researchers claimed to have 'discovered it'.

What I have attempted to demonstrate is that, methodologically, there is not much difference between Chambers' work and that of positive researchers—the left-hand side of that shown in Figure 1. In fact, Chamber states that his *AE&EB* 'was foreshadowed by certain propositions cast in positive form in a paper of 1955' (1993, p. 20). The differences lie in the type of observations and the assumptions. Despite the protestations of its adherents, positive research is a methodology of logical positivism. So too is the scientific method championed by Chambers. The conclusions are very different and herein lies one of the inherent defects of the logical positivist program. Despite its claims to objectively derived knowledge it produces knowledge that its users define and it is thus extremely subjective knowledge that results. Such knowledge is ideologically driven.

It has become fashionable to distinguish positive from normative research. This false distinction is one of the greatest misfortunes to befall all theoretical discussion in respect of scientific method. As Chambers has noted, it has been 'widely used [in accounting] pejoratively' (1993, p. 9). It was used in economics to discredit prescriptive policy promoting economic theorizing and has been adopted as part of the rhetoric of accounting researchers conforming to a particular ideology. Wiles has defined an ideology as a general and coherent *Weltanschauung* (i.e., world view), felt passionately and defended unscrupulously. It contains sacred propositions of a factual sort. In the face of contrary evidence the words of these propositions will be redefined or the philosophical status of the propositions will even be changed (1979–80, p. 155).

In the accounting literature, which includes the vast range of textbooks, the propaganda has been perpetuated such that normative means prescriptive and value laden while positive means descriptive and objective. What I have shown above is that all so-called scientific theories will contain propositions which are descriptive and propositions which are based on assumptions (that are subjective). This is no less true of positive accounting than the research that preceded it and it is disappointing that many textbook writers and teachers are unaware of this. It seems that the myth is designed to convince students and others that positive accounting is objective knowledge while non-positive accounting is subjective and value laden. Once again, an ideology is being promoted (see some of the critiques of positive accounting in which this matter is raised; for example, some of the papers in Tinker and Puxty, 1994; Sterling, 1990; or even Chambers, 1993).

An important element of positivist theory construction is testing. Tests are conducted to consider whether what has been theorized is acceptable for practice. For the positive researchers the utility of a theory lay in its ability to explain and predict. As a positivist Chambers also believed in the importance of testing. However, his testing is considered to be less rigorous than that of the positive researchers largely because he does not have the same degree of sophisticated statistical significance tests. Chambers certainly does not extend testing to the same mathematical and statistical levels as the positive researchers. This is sometimes mistakenly interpreted as making his theory less empirical. This, of course, is not so. Empiricism relates to the source of knowledge being sensory experience. It does not refer to the extent of the data in the testing of the theories. A product of this need for testing in positive research has been an overemphasis on the tests at the expense of the question such that the aesthetics assume greater significance than the research question. Often the research questions become quite trivial, even banal. In attempting to win acceptance of his theory Chambers performed several tests. These tests were often descriptive and certainly did not contain the quantitative sophistication which many younger researchers were seeking to slake the thirsts of the research skills they had been nourished on in graduate school research methods courses. One reason was that Chambers was trying to win his theory's acceptance from the practising community, not academic peers. Consequently, he relied on logical argument and cases of the disasters that resulted from not changing accounting methods. Some companies did employ his accounting, but not sufficient to create a large database.

In respect of fundamental epistemological questions, the work of Chambers and the positive researchers are similar. There are vast differences in so-called conclusions, due mostly to the very different assumptions with which they started. In addition, Chambers was attempting to create a new accounting theory on which practice could be based. Watts and Zimmerman denied this from the very beginning when they claimed that not only is there '*no generally accepted accounting theory to justify accounting standards, there will never be one*' (1979, p. 306; emphasis in original).

OTHER METHODS OF INQUIRY

Chambers' work is generally consistent with the views he expressed early in his publishing career. He was seeking a greater intellectual basis for accounting knowledge and he methodically set about creating this. In his early works he set out the ground rules for what he saw as intellectually rigorous theorizing and followed this with a theory that adhered to those rules. These rules were those of the hypothetico-deductive or scientific method derived from logical positivist or logical empiricist precepts. I had many discussions and debates with him. The subject was inevitably my disquiet with this method and the unanswered questions he addressed to me before his death were aimed at continuing this debate. The method ignores many issues surrounding theory construction and acceptance and I saw in his efforts my views being reinforced and confirmed. It had been subject to sustained and devastating criticism from philosophers of science and had all been rejected in most disciplines. That it was naively adopted unquestioningly by the positive researchers led me to dismiss the theoretical significance of their efforts.

Chambers had meticulously followed the precepts of scientific theorizing, yet his conclusions were unacceptable to the practising community and rejected by the new wave of researchers. Scientific method was supposed to generate objective knowledge, yet what he produced was dismissed by those in the discipline. This suggested that there was something very wrong with the claims to reliable knowledge that the supporters of the method held out. The positivists (including Popper) had distinguished between the context of discovery and the context of justification. Scientific appraisal was restricted to the latter and the former eschewed. This is because they could not explain the origins of new thoughts but they could assess the processes by which the new ideas were converted into theories. In so explicitly stating his assumptions, Chambers opened himself up to a wide range of criticisms. Thus, it was easy for Watts (1995) to claim Chambers' assumptions (like those of other so-called normativists) were inappropriate. In fact, given that Watts came with very different views as to the purpose and functions of accounting information he was quite justified in so doing, as I am in rejecting positive research. That is, we all bring to the process of developing and understanding knowledge our predispositions and predilections. To Watts, accounting existed to support the economic ideological position championed by Chicago-style neoclassical economics. Positive researchers all bring a similar ideology to their work—they are the implicit assumptions in their theory. To this extent Chambers was too idealistic. He believed in the supremacy of logic and rationality. He set high intellectual standards which he religiously followed. These went beyond mere intellectual abstraction to highly principled standards of behaviour. To him, often-encountered suspect business practices were not ethical because they were not rational. The manipulation of accounting information for less than desirable ends was inexcusable, intellectually then morally. The pursuit of intellectually derived truths was an ultimate human activity; anything less was not only undesirable, it was dishonest.

To me, accounting is socially constructed and exists to support hegemonic institutions and systems. It is increasingly being used to justify an economic ideology that promotes the interests of those involved in financial securities markets. However, its potential is far greater, for knowledge of accounting can empower many other individuals or groups. The work of Briloff (1976), Clarke *et al.* (1997) and others supports this contention by demonstrating the limits to which some have gone to use accounting to justify economic actions. There are many with less undesirable motives who will also use accounting to support their economic actions. Thus, accounting is a social tool which will be used to manipulate social situations. There is nothing new in these sentiments and they have been expressed more eloquently and at greater length in many other places (e.g., Niemark, 1992; Lehman, 1992). It is a view rejected by those who hold to the possibility of an objectivist knowledge and those who possibly see it as a threat to the position they hold (such as capital markets researchers?).

Chambers is one of the former. However, a slight softening of his views is visible in his later work. Frustration at seeing his work denied led him to seek other methods of inquiry to present yet another view of its merits. He resorted to literary attempts (see 'Aide-Memoire' in this issue of the journal), but more seriously he turned to history. He sought the origins of notions and traced them through to their contemporary usage. His efforts, however, relied more on conventional historical method rather than the more radical Foucauldian analysis despite the genealogical purpose. Perhaps had he used the latter he would have been more (obviously) aware of the use (and misuse) of knowledge to support dominant social arrangements. This is clearly evident as a reading of the work by Tinker and Puxty (1994) in relation to the methods by which positive accounting researchers have captured a discipline.

SIMPLICITY AND CERTAINTY

To believe in a knowledge that is certain is to deny the postmodern condition in which the world now exists. While there are standards to which we can aspire, there are no absolutes. Chambers did not appreciate this and in his later works was still calling for simplicity (1999) and certainty made possible through correct notions of measurement and representation. If we are in a postmodern world then it is because there has been a change in the fundamentals of capitalism in which we have moved from the production of material, substantive things, to commodity exchange. The meanings of money and capital have changed. Therefore, we cannot claim there are methods by which we can measure these things with any real degree of certainty as we are unsure what they are. Money, previously only a medium of exchange, assumes an inherent value.

If we are in a postmodern world there are multiple realities and we choose the one that best suits our ends. Positive researchers have chosen one in which the market assumes omnipotence. This is a simplicity assumed for reasons of security, as many economic questions can be disposed of by recourse to the rhetoric; the medieval 'God knows' becomes 'the market knows'. So, we do not have to think about the 'big questions' too much. The move towards so-called global accounting standards is yet another version of reality such that the reality of a firm in Indonesia assumes the same reality as one in the United States despite vast cultural differences. Yet this is a reality necessary to access international capital.

Chambers' reality was one in which there was certainty and the possibility of rational economic actions. Consequently, he envisioned the possibility of uncovering universal economic truths. Despite my deep respect and admiration of him, I have increasingly found this hard to believe. I can accept many of his conclusions, but not because of his methodology.

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ALLAN BARTON

Reflections of an Australian Contemporary: The Complementarity of Entry and Exit Price Current Value Accounting Systems

One of the great controversies in accounting concerns the use of current value accounting systems in place of historical cost systems, and the relative merits of the two current value systems proposed—CCA and CCE. Chambers developed and argued the case for CCE. In this essay, the fundamental nature of each system is outlined and related to the economic theory of the firm and its associated theory of optimum resource allocation. It is shown that both CCA and CCE theories are conceptually valid and provide necessary information for efficient resource allocation decisions; however, neither system can provide all the *ex post* information required and they complement each other.

Key words: Accounting; CCA; CCE; Resource allocation; Theory of the firm

One of the greatest controversies in accounting theory and practice in the latter half of the twentieth century concerned the limitations of conventional historical cost accounting and the advantages of current value systems. The period was characterized by strong inflationary pressures and volatility in asset prices. Ray Chambers was one of the initiators of the debate and he remained at its forefront throughout his long career. His research and publications on the topic are prolific.

The topic is of fundamental importance to all accounting measurement systems. Business entities (hereinafter firms) are formed to earn profits from their activities, and they must maintain sound operating and financial positions throughout in order to survive and to have the capacity to earn profits. These fundamental facts of business life are reflected in the importance attached to the income and financial position statements in all accounting measurement systems. All accounting concepts and measurements flow from the information which needs to be reported in these two financial statements.

Unfortunately the strong case for current value accounting systems (CVA) over historical cost accounting (HCA) was marred by the formulation of two alternative current value systems—one based on current entry prices (current cost accounting, or CCA), and the other on current exit prices (current cash equivalents, or CCE); and secondly by the strong advocacy of the merits of one system over the other.

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Chambers throughout was a trenchant critic of HCA systems and a strong advocate of CVA.

In his earlier years he embraced CCA, but during the mid-1960s he reconsidered the issues and developed his new system of CCE accounting based on the use of exit prices. His new theory, which was quite revolutionary in the context of accounting theory for the rigour of its arguments, its breadth of knowledge embodying a multidisciplinary approach, and its model of accounting measurement, was presented in *Accounting, Evaluation and Economic Behavior* (1966). All subsequent references to Chambers are to this seminal work. The treatise immediately had a major impact on accounting thought and it remains one of the most quoted books on accounting theory.

In this article, I wish to demonstrate that both CVA models of accounting measurement are valid ones which complement each other. In markets where transaction costs are negligible, the two largely coincide; however, the interesting cases occur where buying and selling prices diverge substantially, as is typical of most industrial markets. In this situation, it is argued that both systems present necessary information for the management of resources in a firm's operations. Whichever system is adopted, information from the other is still necessary for specific purposes. The complementary nature of the two systems is based on the analysis of the economic theory of the firm as originally presented in Marshall's *Principles of Economics* (1920), the first edition of which was published in 1890. I have adopted the Marshallian approach because it is the seminal one in microeconomic theory and most subsequent theory is based upon it. Marshall was 'the doyen of British economists in the nineteenth century and the founder of the Cambridge School of Economics' (Groenewegen, 1996, preface) and 'he turned Cambridge into the premier fountain of economics in the entire world' (Stigler, 1990, p. 10).

Marshall had a profound knowledge of the operations of British industry at the time, and this influenced the development of his theory. *Inter alia*, he introduced the concepts of cost and demand functions, the principle of substitution, time periods and marginal analysis into the theory of the firm, and formalized the equilibrium conditions for profit maximization. His theory incorporated much description of institutions and business activities, and real time, and was less abstract than subsequent economics textbook presentations of the theory of the firm. However, the standard diagrammatic presentation of the theory used below was developed by later economists.

My article covers the following matters: (a) a statement of the purposes of accounting information; (b) an explanation of the theory of optimum resource allocation which underpins the economic theory of the firm; (c) application of the theory to the CCA and CCE measurement systems to highlight where each system provides relevant information for management of a firm's resources and for measurement of economic performance and financial position; and (d) a summary reconciliation of the two CVA models highlighting their complementary uses.

The article is confined to arguments for each basis of asset valuation (liabilities should be valued on the same basis so as to determine financial position), but the issue of general price level changes is not addressed because in both systems the unit of measurement is defined as a unit of constant purchasing power. General price level changes do not affect the measurement of assets and liabilities at current market values; rather, the effects are confined to the capital maintenance adjustments (and hence income) in the income statement and to the residual equity in the statement of financial position.

THE PURPOSE OF ACCOUNTING MEASUREMENTS AND FINANCIAL STATEMENTS

It is now generally accepted that accounting systems ought to be financial measurement and communication systems which provide useful information to various users of the information, as advocated by Chambers (p. 102). Most professional accounting bodies have adopted this approach in their statements of accounting objectives which are used as a basis for the formulation of accounting standards. For example, the Australian Accounting Standards Board (1990, para 26) states that the objectives of financial statements are 'to provide information to users that is useful for making and evaluating decisions on allocation of scarce resources'. The U.S. Financial Accounting Standards Board has a similar statement of objectives (1978), as does the International Accounting Standards Committee (1989).

Thus, accounting information must (a) assist management, investors and other stakeholders in making decisions to use resources efficiently and effectively in the firm's operations in the furtherance of its profit goals, and (b) provide appropriate information to assist stakeholders in evaluating the profit performance and financial position of the firm resulting from the use of those resources. This need to provide information for efficient resource utilization and performance evaluation underlies both seminal works in CVA, that is, Edwards and Bell (1960) on CCA and Chambers (1966) on CCE.

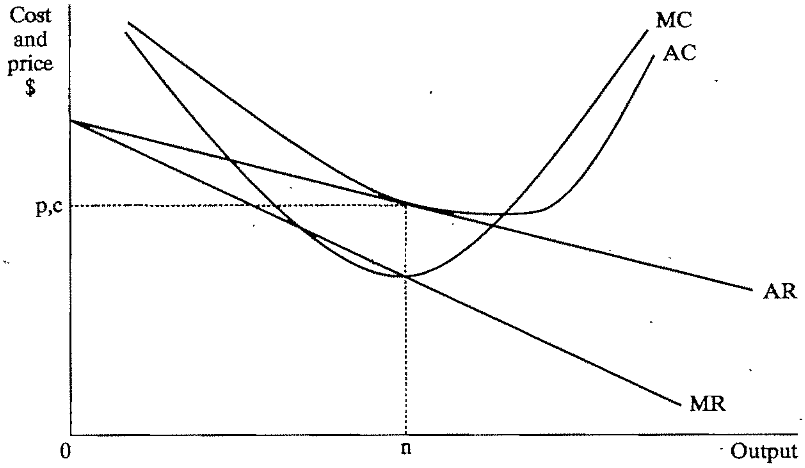
THE ECONOMIC THEORY OF OPTIMUM RESOURCE ALLOCATION AND THE THEORY OF THE FIRM

In economics, firms are productive entities which acquire resources from factor markets, utilize them in a productive process and sell the end product. They do so in the expectation of recovering all their expenses of operations and making a sufficient profit which at least covers the cost of capital. The existence of competitive market structures forces firms to use their resources efficiently in the production of goods and services which buyers want, and ensures that prices are kept to a minimum. The operations of a firm with a given set of fixed factors are summarized in economic theory in Figure 1.

The figure is drawn for a firm operating with a given set of fixed factors in a monopolistic competition market situation in which there are at least several firms competing in the sale of differentiated products. However, it makes no difference to the accounting measurement system as to whether a monopolistic competition or atomistic market structure is adopted. The average revenue (AR) function or demand function for the firm's product is downward sloping to indicate that there

FIGURE 1

DETERMINATION OF OPTIMUM PRICE AND OUTPUT



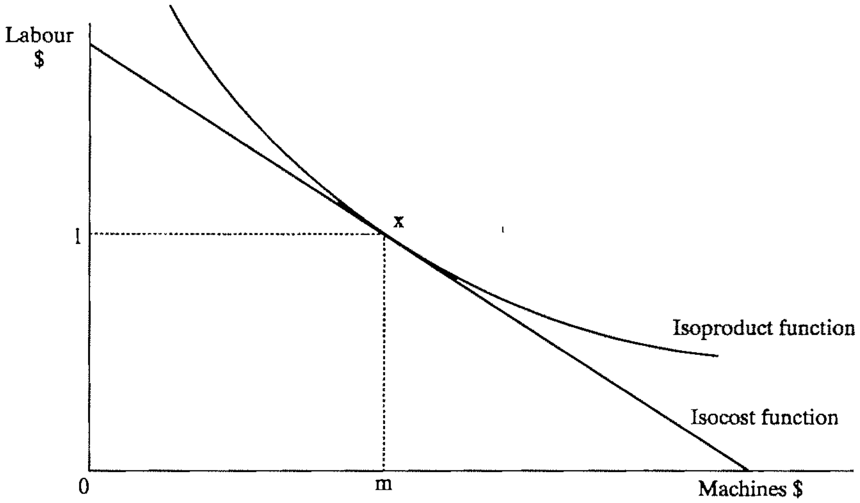
is a limit to sales at each price, and prices must be reduced to sell more. The marginal revenue (MR) function shows the increment in total revenue resulting from each increment in sales, and always lies below the AR function because price reductions affect all sales made. The average cost (AC) function comprises both the variable and fixed costs of the firm's production activities, and includes the cost of capital (which is the normal profit requirement). It is typically drawn as a U-shaped function. The marginal cost (MC) function comprises the cost of using additional resources to increase output. It is also typically drawn as a U-shaped function but it need not be of this shape; however, it must be upward sloping at higher levels of output because there must be a limit to output in the short run from a given set of fixed resources. The firm maximizes profits at that output at which MC = MR; here it makes no profit on the marginal unit of output. In the situation illustrated in Figure 1, the optimum output occurs at sales of 0n and price 0p just covers average cost 0c. The firm recovers all operating costs from revenue, including the cost of servicing its capital investment.

Underpinning this analysis of the theory of the firm is an extensive theory of optimum resource allocation for firms as units of production and for the economy as a whole. The following explanation is confined to a simple model involving only two factors of production (labour L and machines M), and two products (A and B). However, the same principles apply to more complex (and realistic) situations. With regard to individual firms, each must acquire and utilize resources in such a way as to satisfy the three following conditions:

One: Equate the marginal rates of productivity of the two factors in production (MRP_{LM}) with their marginal rates of substitution in the factor markets (MRS_{LM}) to determine the optimum combination of inputs, as illustrated in Figure 2.

FIGURE 2

DETERMINATION OF OPTIMUM COMBINATION OF INPUTS



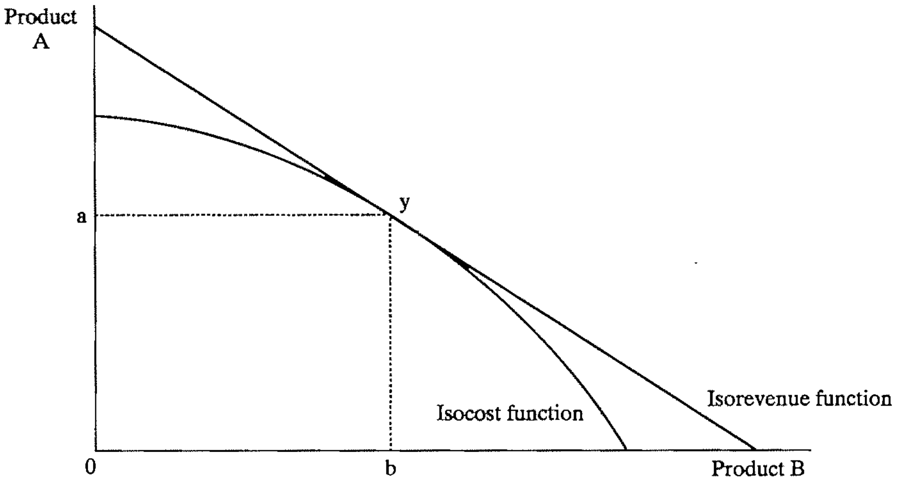
The MRP_{LM} or isoproduct function shows the rate at which an additional unit of one factor (a machine) can be substituted for (less) labour while total output is held constant. The slope of the function depends on the relative productivities of each factor at each combination. The MRS_{LM} or isocost function is similar but relates to the substitution of outlays on machines for labour in the factor markets. It shows the rate at which labour must be sacrificed for the expenditure on each additional machine while total outlays remain constant. Given constant factor purchase prices, the function is a straight line. In order to minimize the total cost of producing a given output, firms must select that combination of labour and machines (i.e., production technique) where the two marginal rates of substitution are equal (i.e., at point X where the functions are tangential). This occurs at the input of 0l labour and 0m machines. This is the efficiency or optimum resource allocation condition for that level of output. Any other combination of factors incurs a higher cost.

Two: Equate the marginal rates of transformation of the two products in production (MRT_{AB}) with their marginal rates of substitution in the product markets (MRS_{AB}) to determine the optimum product mix, as illustrated in Figure 3.

The MRT_{AB} or production transformation function shows the rate at which more of product B may be substituted for product A in a multi-product firm to maximize production while total costs are held constant. It is also an isocost function. The slope of the function is determined by the relative productivities of labour and machines in producing each good. The MRS_{AB} or isorevenue function shows the rate at which additional sales of B can be substituted for those of A while total

FIGURE 3

DETERMINATION OF OPTIMUM PRODUCT MIX



revenue is held constant. The slope of the function is determined by the relative selling prices of each product, and is a straight line in competitive markets. In order to maximize revenue from the sales of A and B, the firm must produce each product where the two marginal sales of substitution are equal, that is, at point y where 0a of A and 0b of B are produced and sold. At any other combination of A and B, a smaller revenue is generated from the same total cost. This is the effectiveness condition, and it also requires an optimum allocation of resources between the production of each product.

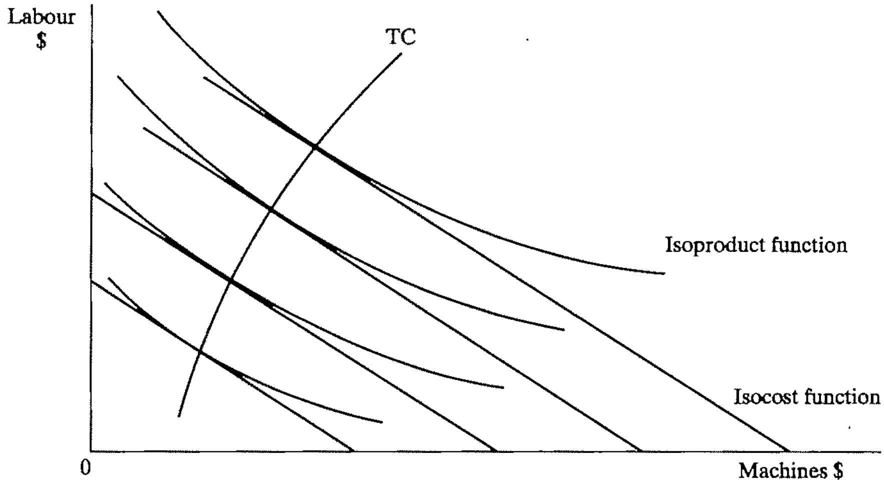
Three: Produce at that output at which marginal cost (MC) equals marginal revenue (MR). This is the profit maximization condition, and it also requires an optimum allocation of resources. It is illustrated above in Figure 1.

By constructing a series of such figures for increasing levels of input and output, a production surface can be obtained and a total cost function (TC) extending over a range of output can be derived. The AC and MC functions are then derived from it. For example, the efficient TC function for a single product firm using only two factors of production and illustrated in Figure 4 is derived as follows.

The TC function of the firm as the scale of this output is increased is based on the requirement for an optimum allocation of resources at each level of output, and with it, the AC and MC functions. It shows the minimum costs that must be incurred to increase output where there are no fixed factors of production. The cost functions in Figure 1 are derived from the type of construction used in Figure 4. A similar analysis can be applied to the derivation of a total revenue function for a multi-product firm based on the optimum combination of products and of production techniques.

FIGURE 4

DETERMINATION OF EFFICIENT EXPANSION PATH



Although the above illustrations are highly simplified abstractions of reality, the same principles can be applied to cases involving many types of resource inputs and products using mathematical techniques such as linear and non-linear programming and data development analysis. These techniques allow determination of optimum production techniques, product combinations and levels of output for complex situations.

Furthermore, where these conditions are satisfied by individual firms, it can be demonstrated that under a rigorous set of conditions which include competitive market conditions, complete mobility of resources and of consumers, well-informed markets and the absence of externalities, an optimum allocation of resources throughout the economy can be achieved. This is referred to as the Pareto optimum in general equilibrium theory. The Pareto optimum occurs where no one producer or consumer can be made better off without making someone else worse off (Stiglitz 1988, p. 90). Economic and social welfare of the nation are optimized at this point, given the initial distribution of income and wealth among members of society.

Thus the conditions for an optimum allocation of resources at both the firm and national levels are complex and not readily achievable. However, they have important implications for firms and for accounting information systems. In order to maximize profits, a firm must:

1. adapt its production methods (resource allocation) to take account of current market buying prices of resources and their relative productivities in order to minimise costs at each level of output (the efficiency condition);

2. adapt its products and product mix to take account of consumer preferences in order to maximise its revenue at each level of output (the effectiveness condition); and
3. produce at that level of output at which MC = MR (the profit maximisation condition).

The implications of resource allocation theory for accounting information systems are considered next.

RESOURCE ALLOCATION THEORY AND CCA

The theory of optimum resource allocation indicates the type of information relevant for the management of a firm's resources. Given that the primary objective of accounting measurement is 'to provide information to users that is useful for making and evaluating decisions on the allocation of scarce resources' (SAC 2 1990, para. 26), the theory provides a rigorous analysis of the information required. The resource prices required are their current market buying prices under normal market conditions. Marshall referred to them as supply prices, that is, the price that has to be paid to call forth an adequate supply of the resource (1920, p. 282). Nowadays they are called the market opportunity costs of the resources. Supply prices depend upon the length of time available for the supply of the resource. In the very short run (Marshall's market period), they are influenced mainly by the existing stock of resources available in the market; in the longer run where production adds to the stock of resources, they are mainly influenced by the cost of production. Marshall (Chapter 5) emphasized the longer run periods comprising both the situation where plant is fixed in supply but its rate of utilization can be varied (his 'normal short run period'), and where all resources including plant can be varied (his 'normal long run period') in his analysis.

In the modern terminology of market opportunity cost, the relevant resource prices to use for resource allocation decisions are their normal buying prices where it is profitable for the firm to purchase them. These are the prices at which producers are willing to supply the resource. They are the opportunity costs of the resources in the market, and unless the firm is willing to pay the market price it cannot acquire them and the resources will be purchased by other buyers. Where it is no longer profitable for the firm to acquire resources at their normal buying prices, but the firm has some stock of the resources on hand, the appropriate opportunity cost of those resources is their current market resale price (Marshall's market period).

CCA should be based on the economic theory of optimum resource allocation, though it is not always evident from the literature that it is so. The theory demonstrates why current market prices of resource inputs (based on the appropriate measure of market opportunity cost) are always relevant for resource allocation and control decisions; and, secondly, why a firm must keep on adapting its production methods, product mixes and levels of output as changes occur in the buying prices of its resource inputs and in the selling prices of its products if it is to be an efficient, profit-maximizing firm. The analysis covers investors as well. Investors must be rewarded at least the market opportunity cost of their funds for them to subscribe and retain their investment in the firm; otherwise they will withdraw them and invest them elsewhere. The market opportunity cost of capital funds is included in the cost functions of the firm.

The appropriate valuation bases to use for assets used as resource inputs to a productive process are their normal buying prices or, in the case of existing assets no longer worth acquiring, their lower market resale prices. Furthermore, the measures of income, financial position and rate of return on investment are conceptually valid and relevant ones for the measurement and evaluation of operating performance and financial position. The CCA income statement charges the expenses of all resources consumed over the period, measured at their current market prices, against the sales revenue of the period. According to whether a real purchasing power concept or a physical capital maintenance concept is adopted, profit is the surplus which can be distributed to investors while maintaining capital (as defined) intact. In realistic market conditions the two concepts are likely to give similar measures. A firm which distributes the whole of its income is able to maintain intact its physical capability to continue its operations into the future. The statement of financial position shows the current market prices of the firm's investment in its assets, the current market prices of its liabilities, and the owners' residual equity in the firm. The rate of profit on the investment in net assets, when compared with the market cost of equity funds, indicates whether the firm is a going concern or not. If it is so, the statement of financial position indicates that the firm should be able to meet its existing financial commitments from expected future cash operating inflows, existing financial assets and sale of surplus or obsolete assets. A more detailed explanation of these matters is given in Barton (1984, Chapter 26). Subject to the reliability of the asset valuations, the financial statements can faithfully represent the financial performance and position of a firm within the context of the accounting valuation model.

In addition to the above general uses of CCA information for resource management and the measurement and evaluation of income earned and financial position, CCA information is useful for a number of specific purposes. These include:

Physical Asset Management Policies In addition to decisions to acquire or dispose of physical assets, CCA information is relevant to the determination of asset maintenance policies. Repair and maintenance policies affect the productivity and lifespans of depreciable assets and their resale prices. Optimizing these policies involves consideration of buying and selling prices over time. In the case of building maintenance, for example, current costs of building reconstruction are often used as the basis for determining long-term and annual maintenance budgets. Maintenance needs to maintain the physical quality of a building are calculated as a percentage of the current cost of the building, and this is upgraded annually through the use of detailed building cost price indices. The indices may also be used to revalue buildings annually for financial statement purposes. This method proved to be a most beneficial one when introduced in my university some ten years ago.

Financial Asset Management Policies Management of these assets is considered in the context of the CCE current value system as the two systems treat them similarly.

Pricing and Output Determination As the economic theory demonstrates, the costs that are relevant in determining the optimum output in competitive markets where firms are price-takers are the current costs of supplying the product. Conversely, where the firm has market power and is a price-maker, the relevant costs are again the current costs of supplying the product. Pricing and output determination are fundamental areas of management decision making and profit generation.

Dividend Policy CCA income forms a rational basis for the determination of dividend policy and its associated decision to retain funds for profitable reinvestment in expanding the firm's asset base or otherwise.

The Going Concern Status of the Firm The concept and measure of the going concern status of the firm are based on the ability of the firm to earn a normal rate of profit on owners' investment, where all measures are based on the current market opportunity costs of the resources. The normal rate of profit earned must at least cover the opportunity cost of investors' capital funds. The firm depicted in Figure 1 is a going concern as price just covers average cost, including normal profit.

Maintenance of a going concern status is particularly important for firms having a substantial investment in assets whose current resale values are less than their current market buying prices. The losses incurred from the forced liquidation of such assets can be substantial. Such firms must strive to maximize the *ex ante* value in use of their assets to remain as going concerns as they do not have the option of recovering their investment expenditures from resale of the assets.

Investors are also particularly interested in knowing whether the firm remains as a going concern because of its impact on share prices and future operations. In the case of a listed company, the earning of a normal rate of profit should, *cet par*, maintain the share price at its current level; the earning of additional profit should boost its share price; and conversely for below normal profits. Investors' confidence in the ability of the firm to continue profitable operations into the future are boosted by its present going concern status.

In all of the above analysis, a Marshallian long-run approach is adopted. While no firms have a guaranteed future existence, the normal expectation is that firms that meet the going concern requirement will continue to operate into the indefinite future. This is attested to by the long lives of successful companies. Firms of any significant size must plan for the long term. They invest in long-term assets; they borrow funds on a long-term basis; and many of their expenditures on product and market development, on administrative systems and on staff training, are sunk costs. One of the major tasks of management is to maintain the firm as a financially viable going concern entity to protect owners' investment, as well as their own jobs and remuneration. Long-term plans and budgets are subdivided into short-term segments to assist in management control and performance evaluation. These budgets must be compared with the outcomes of their plans as summarized in periodic financial (and other non-financial) statements. The budget/actual comparisons also provide a spur to adaptability to changing market conditions. Operating costs in the short-term period are heavily influenced by the long-term decisions with respect to product design, plant size and design, location and so on. The cost functions in Figure 1 form part of the long-run cost functions of the firm, as Figure 4 illustrates. In this long-term approach, flows of resources are emphasized rather than the existing stock of resources. Firms of any significant size are regularly involved in acquiring new long-term physical assets throughout the year for replacement and/or expansion purposes as well as short-term assets such as inventories. A flow approach is needed to analyse the allocation of resources on an efficient basis in markets.

RESOURCE ALLOCATION THEORY AND CCE

As with CCA, Chambers likewise stresses the importance of accounting information for use in resource allocation decisions. 'Changes in relative prices of goods and services give rise to shifts in the use of resources, in the composition of production, and in the composition of demand' (p. 77). For the type of decision he is concerned with, the relevant measure of market value is the current resale price of the resource. He vigorously rejects the use of historical cost prices. 'At the present time, all past prices are simply matters of history. Only present prices have any bearing on the choice of action' (p. 91). Chambers also compares buying and selling prices as alternatives and, correctly for his purpose, adopts selling prices:

> there are only two prices which could be used to measure the monetary equivalent of any non-monetary good in possession, the buying price and the selling price. But the buying price, or replacement cost, does not indicate capacity . . . to go into the market with cash for the purpose of adapting oneself to contemporary conditions, whereas the selling price does. We propose, therefore, that the single financial property which is uniformly relevant at a point in time for all possible future actions in markets is the market selling price or realizable price of any or all goods held. Realizable price may be described as *current cash equivalent*. (p. 92)

In developing his accounting information model, Chambers was heavily influenced by contemporary literature on the behavioural theory of the firm, particularly that of Simon (1949, 1957, 1959), and Cyert and March (1963). This positive behavioural theory was based on observations of firms operating in realistic market conditions, and it was far less formal and abstract than the neoclassical, normative theory based on Marshall. In particular, the behavioural theory stressed the ever-changing and unpredictable nature of markets and uncertainty of future market conditions. In such an environment, firms must be able to adapt promptly in order to survive: 'so long as the environment of the firm is unstable (and unpredictably unstable), the heart of the theory [of the behaviour of the firm] must be the process of short-run adaptive reactions' (Cyert and March, 1963, p. 100; quoted in Chambers, p. 205).

Chambers recognized that such market shifts give rise to the need for adaptation (see quote from p. 77 above), and that the financial condition of the firm, as measured in terms of CCE of its net assets, provided the financial capacity for adaptation. 'Financial position at any time is the basis of action' (p. 112). This is the central focus of his theory of accounting measurement and a primary purpose of accounting information.

Several attributes of this approach should be noted. First, it represented a shift in the pre-eminence of income measurement then in vogue to primary emphasis on measurement of financial position. Second, the approach emphasized short-run analysis based on the existing stock of assets (Marshall's market period) over a long-term approach, or a stock of resources approach over a flow approach. 'In a very real sense, the operations of a firm consist of an overlapping sequence of short-term investments' (Chambers, p. 200; see also pp. 204–5).

In this unstable market environment characterized by uncertainty of the future, current resale prices of existing assets are always relevant for adaptive behaviour with respect to those assets. Firms must always be prepared to consider the realization of some or all assets. 'In relation to adaptive behaviour, the relevant price of goods in possession, their opportunity cost, is the present market resale price' (Chambers, p. 201). This price, an *ex post* magnitude, must be compared with expectations of benefits flowing from the firm's future use of the asset (as quantified in its discounted cash flow present value), which Chambers refers to as 'anticipatory calculations' (p. 83 and elsewhere). Chambers was always meticulous in distinguishing between *ex post* measurements and *ex ante* calculations. He accepted the relevance of the latter for decision making about the use of resources, but insisted that they cannot form part of an accounting measurement system (pp. 96–9).

The statement of financial position prepared according to the model is a valid and useful one. It shows the inventory of the firm's vendible assets and liabilities at their realizable values at balance date. As well, the aggregate value of net assets shows its total financial capacity to do things in the future from its existing assets, its state of solvency, and the opportunity cost of remaining in its present line of business. The income of the period, computed as the gain in net assets after maintaining intact the beginning-of-period general purchasing power of owners' investment, shows the additional purchasing power accruing to owners from their investments in the firm over the period. The rate of return on net assets shows the return on investment achieved over the period and this can be compared with the rates of return on alternative investment opportunities. All the concepts measured are conceptually valid; the information is relevant for decision making about future use of the firm's existing resources, and for the appraisal of financial performance and position. Subject to the reliability of the asset valuations, the financial statements can faithfully represent the financial performance and position of a firm in the context of the accounting valuation model.

In addition to the above broad uses of CCE information for resource allocation decisions, it is relevant for the following specific resource use decisions.

Retention or Sale of Specific Assets Current resale prices of existing assets are always relevant for decisions about retention or disposal of specific assets. Their value-in-use (i.e., present value, PV), must be compared with their value in exchange (i.e., their current resale price, CCE). If PV ≥ CCE, the asset should be retained; while if PV < CCE, it should be sold.

Continuation of Operations of the Firm Similarly to the above, a firm which is not a going concern according to the economic criteria outlined above must consider whether it can substantially restructure and reinvigorate its mode of operations to become financially viable again; or if not, what is the optimum process and time to sell its assets (either individually or as a collection). The same form of analysis is applicable.

Measure of Investment Risk in Assets Resale values of assets relative to their historical costs provide a useful measure of risk of investment in assets. Where resale values remain high, the assets are adaptable in their use or ownership, and investment risks in them are correspondingly reduced. However, low asset resale values indicate that a high proportion of the investment costs are sunk ones, and hence the investment risk is high unless investors are confident that the expected future income streams are reliable.

Management of Financial Investment Assets Financial investment assets are cash equivalent assets and their management is more appropriately considered in the context of CCE rather than CCA theory. Particularly where financial investments are listed securities, they can be readily converted into cash at prevailing market prices. Typically the transaction costs incurred in buying or selling listed securities are relatively small (generally below 1 per cent), so buying and net selling prices are approximately equal. Stockmarkets are generally volatile (by the hour, day and year), and security price movements are difficult to forecast accurately. Financial investment managers must continually adapt their portfolios according to movements in current security prices and their subjective expectations of future prices. Historical cost prices are never relevant for decision making about financial investments.

My own experience as a funds manager attests to the necessity of having up to date market prices and using a CCE information system for the measurement of performance and financial position of the portfolio. Upon my appointment as pro vice-chancellor in 1984, I became responsible for the management of university investments, which were primarily for superannuation purposes. Up till 1984, the investment accounting system was a historical cost one and the funds had such a poor record of investment performance that the assets amounted to only *c.* 60 per cent of the actuarial liability of the superannuation schemes. With improved investment management aided by the use of relevant CCE information, the unfunded liability was eliminated within three years; the university contribution rate was then reduced; benefits for many members were significantly improved; and the surpluses generated have materially assisted in funding capital works, long-service leave liabilities and research programs of the university. According to independent actuarial surveys, the university's fund management performance has remained in the top quartile of balanced superannuation funds in Australia for the past fifteen years, and for the five years ending 31 December 1998 it was the top performer.

SUMMARY AND CONCLUSIONS

It can be seen that, at the most fundamental level, the CCA and CCE systems share many features. For example, they both:

- share the same concept of accounting as being a financial information measurement and communication system whose purpose is to provide useful information for making and evaluating decisions about the use of scarce resources;
- share the same concepts of assets and liabilities;
- agree that historical costs are never relevant for this purpose and that only current market prices are relevant;
- agree that firms must continually adapt their operations in accordance with movements in market prices of their resource inputs and product outputs, in order to remain efficient and profitable;
- agree that *ex post* accounting measurements of the current market opportunity cost of a resource must be compared with *ex ante* anticipatory calculations for resource use decision making; and
- agree that accounting measurements must be confined to *ex post* transactions and events.

The only basic points on which the two theories differ is on which of the two measures of current market opportunity cost should be used where the two prices differ—the entry price or the exit price; and with this, the concomitant concepts of capital maintenance, income and financial position. Certainly the systems can give very different measures of income and financial position where the two prices differ significantly, so the choice between the systems is not a trivial one in these situations. Buying and selling prices differ significantly between most wholesale and retail markets for inventories of consumer goods, between new and second-hand markets for durable goods where the goods are initially made to order, and where transactions costs are significant.

In these complex market conditions, information from both systems is required for efficient resource management. Each system provides some essential information for resource management but not the full set of *ex post* information required. For example, where the CCA system is used, information on the realizable values of assets is required for all asset retention/disposal decisions and for measures of risk of investment in assets. The CCA information on the other hand provides necessary information for resource purchase, management and adaptation decisions, pricing and output policies, determination of the going concern status of the firm and its ability to service the owners' capital investment, maintenance of productive capability of the firm, and for showing the financial capacity of the firm to adapt to changing market conditions from its normal cash surpluses from operations and its existing stock of financial assets. On the other hand, where the CCE system is adopted for reasons of market volatility and substantial uncertainty of the future, management must supplement its accounting system information with contemporary asset purchase price data to maintain its adaptability to movements in asset supply prices for efficiency purposes, for pricing and output purposes, and so on. Where the firm adopts CCE because it is struggling to survive, it needs CCA information to assess whether restructuring of operations could possibly make it a going concern. As well, CCE information is relevant for the management of financial assets in all market situations.

Thus both systems provide necessary information for efficient management of a firm's resources and operations in realistic market situations. Given that accounting information systems incur costs to install and maintain, the choice between them should be based on which system overall provides greater net benefits. For firms which can adopt a longer term approach to operational planning, the CCA system is likely to yield the greater benefits; for firms which are forced to adopt a short-term approach, the CCE system is the more appropriate. But in each case, the information must be supplemented by information from the other system to facilitate efficient resource management. The two systems complement each other—they are both based on valid theories of resource management and both provide necessary information for efficient resource management.

Chambers, in promoting the CCE system, has clearly explained the nature and uses of the system for resource management purposes. He has made a major and enduring contribution to the development of income and financial position measurement in accounting. The level and breadth of scholarship in his voluminous writings place him as one of the great accounting scholars of his period.

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R. J. CHAMBERS

Early Beginnings: Introduction to *Wisdom of Accounting*

Incomplete manuscript found in Ray Chambers' home study after his death by his daughter, Rosemary. It would appear that these were to be the introductory observations of a proposed book-length manuscript to be titled Wisdom of Accounting. *It was to be an insider's view of the development of accounting in the twentieth century through the eyes of one its most interested travellers. Reference details for books and articles cited are available in R. J. Chambers,* Accounting Thesaurus, *Pergamon, 1995.*

ACCOUNTING—FOR WHAT?

The conduct of household and business affairs alike proceeds by the recurrent inflow and outflow of identified quantities of goods and services and money, and the holding, between times, of identifiable stocks of goods and money. When dealing with things close at hand, observable, we think, almost automatically, of quantities—in hand, or to be bought, or to be sold, or to be consumed; or of quantities recently bought, sold or consumed. When thinking of things at a distance, temporal or spatial, we rely on messages, documents or records relating to observations of quantities, whether of commodities, or of substantial property, or of money. If the records of quantities on hand and changes in those quantities fully describe what has transpired, the quantities 'of record' on hand at a given date should correspond with what is then observable. The summarized record up to a given date would then provide reliable grounds for making judgments about the past and decisions about the future, and the authenticated 'balances' at the given date would indicate what was then available to proceed to the future. Discrepancies between the balances of record and the observed balances would be indicative of errors in record-keeping, of deliberate deceit or inadvertent gain or loss. They would be removed forthwith; they have no place in the statement of balances at the given date.

Quantity and quantities have been used in the previous paragraph in a quite general sense, of numbers of units in a scale of units appropriate to the things quantified. But, units of what?

Identifiable units of some class of objects, or of some enumerable feature of some object or class of objects. To enumerate, of course, is to count, usually in the scale of natural numbers. We may count sheep, and chickens, in that scale; but we do not count sheep and chickens indiscriminately, obtaining one total, if we wish to make any sense of the count.

At present [1989], towards the end of the twentieth century, a greater proportion of the adult population than in the 1930s is aware of some aspects of financial matters. More people are subject to taxes on incomes, or derive parts of their incomes from the taxes paid by others. Print and electronic media carry far more news and comment on the financial affairs of companies, states and nations than in the '30s. There are more and larger companies, owned or managed by or for more, and more conspicuous shareholders; when they succeed, they succeed spectacularly; and when they fail, they can engulf whole communities in gloom and fear, and individuals and families in dire poverty. Vastly more individuals now make daily use of credit—other people's money—than was customary sixty years ago.

All of these things—income, taxes, subsidies, wealth, poverty, profits, losses, debt, bankruptcy, savings, spending power—have to do with money, money's worth and claims to money. That is what is meant when we speak of 'financial affairs'. Accounting is about financial affairs, about the financial consequences of engagements and transactions of one person, business firm or other organization, with all other such parties (in a nutshell, with the rest of the world). It is, in principle, a systematic process of recording successively, and summarizing occasionally, the effects of events and exchanges on the property holdings and wealth of an identified party. Called 'bookkeeping' [around] seventy years ago it was thus described: 'Bookkeeping is the science and art of correctly recording in books of account all those business transactions that result in the transfer of money and money's worth . . . the art of keeping accounts in such a manner that a man may know the true state of his business and property by an inspection of his books' (Carter, 1923, p. 1).

To know the true state of one's business and property, of course, is not an end in itself. For some centuries it has been averred that that knowledge is instrumental in the conduct of personal or business affairs. If a merchant 'be fortunate and acquire much, it directs him the way to employ it to the best advantage, if he be unfortunate it satisfies the world of his just dealing . . .' (Colinson, 1683, p. 1).

> It is indispensably required of every prudent man to know exactly the computed value and condition of his estate . . . for without that knowledge . . . he can never judge of the present circumstances exactly; whether he has not lost by oversight of his own, or imposition of his neighbours; he cannot make any judgment of the future from the past, or justly reflect upon his own former conduct, whether good or bad. (Stephens, 1735, p. 4)

Some looked beyond the utility of properly kept accounts in the conduct of business to their aid in the settlement of disputes, in the proper division of interests on the occurrence of bankruptcy, on dissolution of partnerships, and on death: 'Next to being prepared for death, with respect to heaven and his soul, a tradesman should be always in a state of preparation for death, with regard to his books' (Defoe, 1726, p. 345).

The growth of corporate business from the early nineteenth century made business accounts a matter, not only of private interest, but also of interest to a wider public of shareholders and lenders. The limited liability company was empowered to trade free of the recourse of creditors to the private property of shareholders in the event of default by the company, but subject to the periodical presentation of a 'true and correct' balance sheet. The 'financial publicity' was held to be a safeguard against deceit on the part of managers and directors, and a set of signals to investors and creditors of drifts in the wealth, debt, solvency and profits of companies for guidance in the pursuit of the interests of those parties.

FINANCIAL MANAGEMENT

Shortly after the outbreak of World War II (1939), there were established departments of 'foremanship and supervision' in the technical education system of the Australian States. Their aim was to speed up the development and improve the quality of supervisory skills in manufacturing and processing establishment. By 1945, the courses offered in the department of the Sydney Technical College had been extended to include programs in production management, personnel management and sales management, and an ill-defined territory described as costing and cost control. There would shortly be added a course, general management.

Initially staffed by part-time people holding supervisory and service positions in business, by 1945 there were a lecturer in charge (Bruce Brown) and two other full-time teachers, supported by a number of part-time teachers. In anticipation of the rehabilitation and training of servicemen after the war, new teaching appointments were to be made. I was the second of two. My principal assignment was the 'costing and cost control' program.

My first aim was to establish 'financial management' as a unit course in parallel with the existing production, personnel and sales management programs. The costing and cost control course I sought to remould virtually took for granted the considerations governing the administration of the financial affairs of business firms. So also did the local standard textbook material relating to accounting, securities administration, budgeting and cost accounting. And those aspects of financial matters were usually treated as free-standing specialisms, each with its own, more or less isolated, rationale. On the other hand, there was a relatively modest management literature that sought to identify the mental processes that distinguished managing from the technical features of the conduct of firms—purchasing, production, staffing, distribution and so on. Those processes were said to be forecasting, planning, organizing, directing, coordinating and controlling—given the aims or objectives of an undertaking.

Nowhere, however, did these two bodies of dicta and descriptions of practices seem to be brought together, as a systematic exposition of the conduct of the financial affairs of firms and the relation of financial affairs to the general conduct of other aspects of business. The literature and curricula of economics provided discourse on the descriptions of the ways in which the supply of and the demand for goods and money were determined for whole economies, but relatively little on how individual firms interacted with one another and with the whole apparatus of a loosely coordinated community in which individual initiative, choice and action played large parts.

TO BEGIN . . .

In 1917, in Newcastle, New South Wales, to Joseph and Louisa Chambers there was born a son, Raymond John. Two years later they had a second son, Albert Cyril (Bert). Joseph had come to Australia, at age 20 (?) [presumably Chambers was going to check this age], from a Yorkshire family of underground coalminers. Having no trade skill, he became employed as a labourer in the steelworks recently established in Newcastle. Louisa was one of the daughters of another coalminer, from Wales, who had come to Queensland, worked in the coalfields there and in Victoria, and settled in Newcastle. Joe and Lou built a home on an eminence overlooking the estuary of the Hunter River, with the steelworks upstream a mile or so, and the busy port and business district at the mouth of the river several miles to the south.

Then, stop. Lou developed symptoms of a dietary imbalance or glandular disorder which in a few decades' time would have been curable, but which in her case proved fatal. My brother and I have no recollection of the distress this must have caused. We were separately 'adopted' into the families of two aunts, one on each side of the family, until Father had rearranged his affairs. [Raymond John spent that time on a family farm at Quarrobolong, some thirty miles out of Newcastle in the direction of Cessnock.] In due course, he [Father] married Esme Mabel (May), daughter (about his own age) of a family that had grown up in the Northern Rivers district of New South Wales. He sold his first home, built another closer to the centre of the city [at Islington], [Chambers wrote in an unpublished note: 'Father borrowed next to acquire a tract of several acres in Mayfield, for subdivision and home-building. He built a house for us to which we moved about 1927–8.'], and, anxious for freedom from the shiftwork of the steelworks and for his own independence, bought a retail milk-vending business. [In another unpublished note, now part of the Chambers Collection, 'Figuratively Speaking', Chambers wrote: 'Those were years when milk was sold by vendors whose customers were spread all over the map. Milk was dispensed from cans or tanks by measures, customers' receptacles might be anywhere from the front step to the rear kitchen; deliveries began with full tanks at a central depot, beginning almost any time after midnight, and ceasing about 7 or 8 a.m. As a sideline Father grew vegetables in the small plot that was our backyard. Mother had a hand in it all, from washing up after the morning's deliveries to packing vegetables for sale in the neighbourhood.

The outlays on home and business were well beyond the means of a labourer, frugal though he was. They were funded by borrowings. The mid-1920s were relatively comfortable years. But they were years before suburban home deliveries of milk were 'blocked', assured to particular vendors. One competed on the basis of the service one gave, on the personal goodwill of customers. They were years, too, before iceboxes had given way to refrigerators; so for the sake of freshness milk was commonly delivered twice-daily, in small amounts measured from bulk cans to domestic containers, before days and in early afternoon; and on credit, necessitating a weekly 'collection' round. It was a demanding regimen. [A milk vendor had his independence, but he was bound to his business seven days a week, fifty-two weeks of the year. Father had early some sense of the advantage of trading on credit and the prospect of gains from property.']

The latter part of the 'twenties was a period of rising general prosperity. The milk business was sold and a franchise to distribute Sydney metropolitan newspapers was acquired [for £1,000], again on credit. Then came the beginning of the Great Depression. The demand for Sydney papers fell off alarmingly; the business fell ['to a daily sale of 100 papers (making the value of the business about £100 or less), delivered over about two square miles of territory which at that time was sparsely populated. The fall in sales was due, of course, to the fact that Newcastle people, looking for jobs, had little use for a Sydney paper'] in value to one-tenth of its purchase price; so much for the value of 'goodwill'. A franchise for local evening papers and re-entry to milk vending engaged the labour of the whole family, just as, in 1930, I began secondary schooling. The Newcastle Boys' High School, the main secondary school in the region, was at the other side of the city, two miles walk and five miles by train from home. For much of the next five years, school and homework were sandwiched between two hours' 'business' before dawn and two hours of the same in early evening. The necessity of being available, and able-bodied, seven days a week made participation in team sports and other extra-curricular activities impossible.

High school opened up a new world. Our parents had had only an elementary education. Father, though an avid reader of newspapers, never bothered with books. Mother had a small shelf of novels of the time, but that was all. We had no bookish friends or relations. But, at school, English language and literature, French, Latin, Mathematics, Chemistry, Physics, everything, was fascinating. For what had to be done, I earned modest to satisfactory grades, but there was no time for browsing.

Meanwhile, our parents were wondering what calling might be pursued by two teenage boys in the depths of a depression. In those years, many adolescents left school at the end of three years' secondary education, and in 1932 I was in my third year. A visiting vocational psychologist suggested a wide range of vocations that would match my competencies. But many would entail university studies, and the nearest university was in Sydney. Then, why not a correspondence course in advertising and commercial art? I could work in the family business as required, and follow the correspondence course at my own pace. I was enrolled, and commenced the course forthwith.

And, of course, [I] failed to turn up at school when the new term began in 1933. A letter from the Headmaster wanted to know why? Would we please call on him? Mother and I called. He was, he said, dismayed that a lad with a record like mine should think of abandoning the possibility of entry to one of the learned professions. Back to school I went. It was my good fortune to have as teachers in English, Mathematics and Physics men who had an obvious enthusiasm, a love, for their subjects and a capacity to convey to students the idea that there was so much to be learned that was interesting and puzzling. It was a stimulating two years.

At home, the question arose again: what should the boys do as preparation for a vocation? Fifth year at high school was the point at which one would seek employment and/or seek to enter a tertiary education program. The terminal examination at high school was a State-wide examination which served as basis for judgments of potential employers and for admission to the limited number of places in universities, teachers colleges and elsewhere. I would have liked to teach; but teachers college was located in Sydney, associated with the university. The uneasy state of the family's finances made living away from home without an income an unlikely possibility. A maternal uncle was an accountant in practice. Apart from the very simple records we kept of our debts or creditors and customers' debts to us, we had no idea what an accountant was or did; and I do not recall that our uncle was consulted. But our parents decided that we should study by correspondence a course leading to qualification as an accountant, and made down payments for the courses. All this before the results of my final examination were published.

On the occurrence of that event I had four options—a junior clerical position in the N.S.W. public service, a position in the drafting office of the main roads authority, admission to the teachers college, and a university 'exhibition' (an award relieving the holder of tuition fees). If I could live away from home and meet the incidental costs of attending university out of a junior clerk's salary (thirty shillings a week to start), I could combine the first and last of these options. Evening courses were available only in Arts and Economics in the university; and as I had already begun to study accounting (an element in the Economics program) it seemed to make sense to enrol in the Faculty of Economics.

This would be inconvenient for my family, removing one pair of hands from the retail distribution business. But about the same time Bert had been appointed to a clerical position in one of the steel companies of the region, and was able to continue to give help, morning and evening, for some years. It was fortunate for my part that a cousin and her husband and young family of three were living in Sydney, and were willing to accommodate me for a modest 'rent'. Their generosity helped to sustain me for the next five years.

In March 1935 I was appointed to the accounting office of the Department of the Attorney-General and of Justice, and I enrolled in the Faculty of Economics in the University of Sydney. The atmosphere of the metropolis, the content and milieu of clerical work, and substance and manner of university study, were all novel. 'Home' was five (?) [Chambers had presumably intended to check these figures] miles south of the city centre; the Justice Department was located in the city centre; the university was three (?) miles west of the city centre, and six (?) miles from home. That was the 'circuit' on the four days of evening classes in the week—half on foot and half by tram, for the sake of exercise and economy. Weekends would be spread between library and study time on the one hand and walking and swimming on the other—Sydney was well endowed with beaches, parks and gardens, and bushland around its rivers, bays and circumference. When convenient and affordable, I would revisit my family, often for weekends by the overnight steamer that plied between Sydney and Newcastle.

Few people at that time, and perhaps still, could say clearly and succinctly what economics was all about. Speech, writing, calculating, physical and chemical experimentation, are things done personally, and within personal experience. By contrast, economics deals with the aggregative causes and consequences of actions of communities of individuals—with what, in a community, gets grown, or mined, or manufactured, or consumed; with the accommodation of what is produced to what is consumed, through exchanges at money prices; with national income, and national wealth, and national debt. All such matters are not parts of, or even in some respects similar to, personal experience. Commerce—buying and selling and borrowing and lending—we can all know directly; economics we can only know about, by treating things in the aggregate. We can know about law, politics and political institutions, economic history and the history of economic ideas—all parts of the undergraduate economics program—in the same fashion. And of course, for dealing with the aggregative effects of individual actions, accounting and statistics would be studied. With a few hiccups, I graduated in 1939.

Some of the subjects studied were illuminated by work experiences. But I could not see a career with open opportunities emerging from simple clerical work in an establishment devoted to law and justice and their administration. I joined the Shell Company, part of the international Shell petroleum group, in 1938. For a while I served as inventory control officer, keeping track of the quantities of all products and transportable containers spread through regional depots in New South Wales. To an untutored novice, keeping track of those stocks and movements in them seemed a humdrum task, necessary perhaps, but why so constantly in such detail? That is the kind of question that bedevils all who experience parts of a process but never see the whole. The answer is often a long time coming.

A year later I did similar work, for bulk quantities of imported crude oil, some transshipped and some processed, at the company's harbourside terminal at Greenwich. Crude oil was purchased by the ton, but when landed from ocean-going tankers to waterside terminals and thereafter, quantities were reckoned by volume—gallons at the time. The massive tanks characteristic of 'tank farms' wherever liquids are processed, would be dipped for depth and temperature, before and after loading and discharging. The inflow or outflow would be calculated by volume at a standard temperature, using the coefficient of variation of volume with temperature of the liquid; and, if necessary, converted to tonnage by reference to the specific gravity of the liquid. The crude or processed products offloaded at Greenwich were taken by barge, as required, to the refinery, about twelve miles further upriver. The work was varied and interesting; ships would come and go at variable hours; the tides affected the movements of lighters and barges; road tankers would come and go during daytime hours. After about twelve months there followed a spell at the Clyde refinery which was also the hub of rail-tanker distribution [in Sydney].

The petroleum industry was then not a hundred years old; the automobile had become popularly available, but not common, family transport only a couple of decades before. The petroleum products refining and distribution companies were large, and owned overseas. There should be opportunities for advancement through the many levels of responsibility that widespread operations entailed. Out of interest I read extensively of the development of the industry since the mid-1800s, and of the Royal Dutch-Shell group in particular. In 1939 I graduated BEc, and married Margaret, my companion over some years in weekend swimming and bushwalking.

Australia entered World War II a week before Margaret and I married. We moved into a modest but comfortable brick home in Greenwich, five minutes walk to my workplace and a twenty-minute ferry ride across the harbour to the city centre. A transfer from the Shell harbourside terminal to the refinery upriver precipitated moving house to Hurstville, near to the home of Margaret's family but an hour each way by train each day.

Shortly afterwards I completed the professional qualifying examinations of the Australian Society of Accountants. Yet I had had no position in which any demand was made on understanding of or competence in financial matters. Curious about my prospects, I called on my senior officer, Newman, of precise diction but severe mien. What could I do or should I do to advance my competencies? Why not study chain store accounting? he said. At the time I thought the reply a deliberate diversion. Only later was I to see the merit of systematic and up to the date information in the conduct of every complex undertaking, from a state-wide government service, to a nationwide petroleum distribution business, to a chain store.

Weary of almost a decade of mixed 'work and study' days, I still had to complete the accounting correspondence course taken up in 1934. Degrees in economics were by no means common, even perhaps a burden in the search for advancement. So beside the accounting course, I undertook also correspondence courses in cost accounting and budgeting, and in company secretarial work (corporate financial administration). With, as yet, only modest experience and no 'connections' in the city, I had to depend, in the quest for advancement, on what I could show of my competence by 'paper' qualifications.

This brief account of Ray Chambers' early life augments several autobiographical pieces related primarily to the development of his academic ideas, namely: 'An Academic Apprenticeship', Accounting History, *Vol. 3, No. 1, 1991, pp. 16–24, and reproduced in G. D. Carnegie and P. W. Wolnizer (eds),* Accounting History Newsletter, *1980–89 and* Accounting History, 1989–94: A Tribute to Robert William Gibson, *New York, Garland, 1996, pp. 101–11; 'Historical Cost—Tale of a False Creed', presented in the absence of the author by M. J. R. Gaffikin before the annual conference of the European Accounting Association, Turku, Finland, April 1993 and published in* Accounting Horizons, *March 1994, pp. 76–89; and his 1980 article describing the development of his ideas on CoCoA which preceded the Japanese edition of his first magnum opus,* Accounting, Evaluation and Economic Behavior *(1966).*

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R. J. CHAMBERS

Life on the Fringe—An Accounting Odyssey

The following text was found in Chambers' home study after his death by his daughter, Rosemary. That text and handwritten notes were prepared for the two (similar) talks to separate divisions of the Probus Club (a club for professional business people): 'Life on the Fringe' (Sydney Division, November 1992) and 'An Accounting Odyssey' (Wahroonga Division, February 1993). The notes were found several months later in the Chambers Archives by Angelika Dean. Only brief notes remain for the second Probus lecture and it is possible that Chambers used the text of the earlier paper as the basis of that talk, adding the Homeric analogy which is also reproduced here. Prior to the text of the Probus talk appears a paragraph from another related piece of Chambers' writing found in his archives. It is titled, 'Accounting as Vocation':

> This is a personal memoir. It is not about the variety of vocations which training and a knowledge of accounting may open to anyone or everyone. It is about the opportunities and experiences it opened to me. The course of every man's life is a highly specific affair. Some lives are humdrum, some are full of adventure, some are pedestrian and conventional, some are marked by spells of high aspiration or accomplishment and moments of great personal or public importance. Some lives, whose livers think themselves fortunate, are mixtures of all modes and moods. 'Variety's the very spice of life, That gives it all its flavour' (Cowper, *PDQ*, 124). Chance and diligence, comfort and anxiety, inertia and forethought, hope and disappointment, success and failure have provided sauce and seasoning to the banquet circumstance has served me. But why such ado about a life in accounting, when accounting and accountants have long been the butt of impish wit and caustic jibes?

AN ACCOUNTING ODYSSEY

Homer's tale of the adventures of Ulysses has left a legacy of allusions, figures of speech, used today by people who've never heard of Homer—the Wooden Horse, the Lotus Eaters, the Cyclops, the Sirens, Scylla and Charybdis—a mixture of successes and difficulties. It may seem arrogant of me to use the odyssey as a title for a modern time lacking the trappings of the myths. But I'd [have] liked to be an engineer, an architect, a medico. But they involved years of unpaid study, and my father, a small sole trader, had lost all he had in the Depression. But I could study economics and accounting at the university at night if I left home and earned my keep during the day. So I did. Over some fourteen years of academic and professional studies and a variety of junior posts in government and business I learned two things:

- Accounting universally claimed to be related to the growth of business and finance.
- Its rules and products were not the outcome of disciplined reasoning—as in maths and physical and biological sciences—but of traditional rules of thumb and the dogma of its elders—initial cost.

LIFE ON THE FRINGE

I, me and my will figure prominently. I make no apology. I was given an open task. I've never before taken on this one.

What of the fringe? All professions and all professionals live on the fringe. They profess to be expert at one thing, one facet of livers and living. Accountants as accountants live on the fringe of business and they don't make things or sell things: they help, sometimes hinder, those that do. All academics live on the fringe; they address principally those on the threshold of their careers, and if they give serious thought to the advancement of the art they serve, they will find themselves on the fringe both of the substantive professions and teaching profession. I have lived on the fringe in all three senses.

Living on the fringe is always demanding, sometimes exhilarating, always adventurous. Top line persons in the arts, in sport, in science and business all live on the fringe. Some get their kicks out of doing what's not been done before, some from outdoing rivals, some from public applause—some from simply pursuing goals of their choice which others have held to be unattainable. I've had my satisfactions and of all of these in modest measure.

Late last year [1991] I sat in the office of a senior state official expert in law. He said that as a member of the board of directors he could never understand what the annual financial report was saying. There are literally thousands like him—with a vague idea that accounts have something to do with finance but not knowing what the something was. Fifty years ago I had the same idea. I had learned the rules of accounting by rote: there was no other way, for they were, and still are, without obvious and demonstrable connector with the conduct of financial affairs. In lectures and addresses and in my first book in 1947 I foreshadowed reforms which would yield balance sheets and income accounts with genuine financial meaning. I had occasional plaudits from directors and managers who were not accountants; but I had set myself against the entrenched doctrines and practices of my own profession. Some found what I said to be 'interesting'—but none showed any enthusiasm for endorsing my ideas.

I was appointed in the University of Sydney in 1953—again on the fringe. For accounting was not then a profession entered through universities, and the subject commanded little respect among colleagues. One said at one time in a faculty meeting, 'What's bookkeeping doing in a university?' But accounting is one of the most universally practised arts. That its practice was fundamentally faulty was illustrated abundantly by the postwar inflation running into the early 1950s, by the spate of takeover bids in the '50s, '60s and later, and by the disparity between what companies—or what company accounts said their properties were worth and what they were really worth. Company accounts were false, though they were said by company officers and auditors to be true. And what was false could be of no use to managers or investors or creditors. The flaws were universal—and if they could be excused or papered over in practice, that was no safe or serviceable ground for an extensively influential profession. I determined to try to set things right—by reworking the basic ideas, challenging conventional practices or habits, and teaching a set of ideas to the rising generation of practitioners. It would be uphill, against the tide of practice and practitioners. I addressed professionals, businessmen, lawyers—anyone who would listen. 'Have gun, will travel—Have speech, will travel'. But the bulk of Australian ideas and practices had been imported from the United Kingdom and United States. In 1959 I spent a year all over those countries trying to find whether anyone else was working on the same pattern—getting down to basics, as I was. I found no one. Back home in the early '60s I wrote my fourth book setting up the reasons and evidence for up-to-date, market-based valuations of assets in balance sheets and inflation adjusted income calculation. It was published in the U.S., was awarded a gold medal by the American professional institute. It proposed what leaders of the profession had said for decades should be done, but others said could not be done—a book in no-man's land, on the fringe.

But I became well known. I was invited to speak all over the place. In 1966 I went by invitation to University of California at Berkeley. Out of there I made sorties to Alabama, New York, Los Angeles, to Sydney and back, to Michigan, Stanford University, Washington University (Seattle), Edmonton, Saskatchewan, Oregon. In 1970 I wanted to go to just two universities; but the word got around. Starting in Mexico I addressed students and staff in fifteen universities over three months. In 1971, a four-month stint in one and visits to five other universities in Japan. In 1976 I was the first invited distinguished lecturer in the United States, visiting eleven universities all over the States and three in the U.K. Dropping in for three to four days made me an academic gadfly—on the fringe—for one can only generate impressions not convictions in such short spells.

Back in Sydney I was much busier. In the '60s I built a department of about a dozen people intensely interested in the promise of a more reliable and intellectually satisfying style of accounting. We developed the teaching program from being a hand-me-down bunch of rote recipes to a course of study worthy to be included with other courses leading to masters and PhD degrees. I launched a new academic journal [*Abacus*].

For fifteen years through the '50s and '60s I was an examiner on a number of the examinations committees of the two professional bodies. I enjoyed cordial relations then with well respected professionals. For many years I took part, by invitation, in the annual conferences of the Chartered Institute Research Committee, and gave lectures to its members and those of the Australian society. But though I had a research record of no mean dimension, I was never invited to be a member of the Accounting Research Foundation Committee [which was formed in 1965 following the recommendation contained in an ASA General Council White Paper, *Accounting Principles and Practices Discussed in the Reports of Company Failures*] or other committee like it. I was urged to seek election to the council of the Australian society. Three times in succession my nomination failed, eventually I was asked to fill a casual vacancy. A medical researcher once said 'The mind likes a strange idea as little as the body likes a strange protein and resists it with similar energy'. Over the sixteen years I served as a councillor, I proposed many changes in the technical, educational and research business of the society; I can't recall that any one of them became adopted. Despite all that, serving in the ranks I became state president and national president—an eminence not attained before by a mere professor and, in light of persistent rejection of my ideas and proposals, something that I could never seriously have expected. Life on the fringe has strange twists.

During the '50s, '60s and '70s the profession around the world had grappled more or less laboriously with the problem of dealing in accounts with the consequences of inflation. By 1964 I had devised a fully integrated style of accounting which could solve the problem. It satisfied the stipulations made for years by professionals and academics. But the practising and teaching professions would have none of it. They would reach their conclusions in their own way—and that was not by confronting the commercial and financial evidence of faults in practice, but by sheer umbilical contemplation. I made submissions to the appropriate committees and occasionally to governments in the U.K., the U.S.A., Canada and Australia. But almost universally when they came to make comparative assessments of the competing proposals before them, my own proposal was just left out. In Australia in particular, two so-called exposure drafts on alternative schemes [on how to account for inflation] were published [in 1974]. I offered my own, complete with argument and illustration [in 1975]. It was refused. I published it out of the university [in August 1975]. The Research Foundation took no notice.

In 1977 the N.S.W. Attorney-General had a host of cases of misrepresentation through following the conventional [accounting] processes being considered for prosecution and [along with] two others [I was] invited to put existing accounting standards under scrutiny [by forming the Accounting Standards Committee of Inquiry]. There were to be also on the committee a representative each of the Chartered Institute and the Australia Society of Accountants. The institute declined the invitation and the nominee of the society (of which by the way I was the national president) therefore withdrew. Over about six months we produced a 170-page report covering a positive set of proposals and a critical report on all the standards then current. But the boycott held, the profession closed ranks; neither body deigned officially to notice our report! And whether the Attorney-General had been got at we do not know; but no action whatever, except publication, was taken consequent upon the inquiry.

Meanwhile the professional bodies around the English-speaking world were beavering away at inflation accounting. An international professional conference in Sydney in 1972 saw speaker after speaker denounce conventional accounting — the dogs were barking it: the days of cost-based valuations in balance sheets were over! But no sooner had they all gone home than the standards committees brought forth standards for the valuation of commodities, inventories especially, on the basis of historical costs! And from that day to this, virtually all the professional standards in Australia and elsewhere have stuck to the old conventions. In fact so convoluted and obscure had proposals for dealing with inflation become that the whole debate of a verbose decade was quietly swept under the carpet in the early '80s.

But for me it was not all gloom. In 1976 I was named the first of a series distinguished international lecturers invited to visit a selection of some ten universities in the United States over as many weeks. On completion of this assignment

I gave a lecture in the City University of New York, addressed the Financial Accounting Standards Board and the English Accounting Standards Committee, addressed varied academics in four U.K. universities and presented a paper at a research conference in Alabama. As state president of the society and later national president (1976–78) I addressed meetings of members all over the country from Hobart to Townsville and Sydney to Bunbury. Presidential duty took me to professional and educational meetings in Portland, Cincinnati, London, Berlin and Munich, winding up with a lecture to a Pakistan national accounting association in Karachi.

Travel, discourse with professionals and academics around the world, and a perennial interest in the flaws and infelicities of accounting practice, make it plain that over forty years practice and professional doctrine had become more convoluted, less systemic, more questionable, less serviceable, more opportunistic, less orderly. And increasingly the bulk of criticism from within the profession: from academics, from the courts, from governmental inquiries, from investors, creditors, security analysts and others. All of that was entirely predictable. A colleague in the U.S. [Bob Sterling] who thirty years ago had reached the same conclusions as I on the prospect of our up-to-date and realistic accounting has had all the same kinds of experiences as I—popularity as a lecturer to students, academics and professionals but rejection of the thrust of our main interest in the advancement and reconstruction of practice.

Why then should we persist in holding to ideas which fail to command general assent? In the first place, all people on the fringe—in sports, in scientific and other exploratory ventures—sooner or later dispose of the spur of external competition or criticism. One need then turn on his own cherished invention more intense scrutiny than at the point of creation or discovery. One looks for all kinds of evidence and argument beyond the level of common criticism. It's a game played against oneself, or against the best of tests one can discover in other domains of thought and inquiry. I'll mention only one class of tests—the test of history. If practice according to an accepted body of ideas is fundamentally sound, it should cease to be the target of criticism from within and from without. But the body of ideas underlying accounting has come up for robust criticism every five or ten years for most of this century.

Reproduced below are Chambers' handwritten notes found on cards that were prepared for 'Life on the Fringe'. The notes are located in the Chambers Collection correspondence folders. The underlining is as it appeared on the cards—its significance is unclear. Where the editor has changed or added material because of the cryptic nature of the card note this appears in square brackets.

Fringe—all professions / including accounting // all teaching on fringe / and academic work // all critics and innovators—I am on fringe in 3 senses.

Like all novices I learned accounting by rote. Accounting played a significant part in business and commerce as guide to action and as report on performance. But I soon found that it was not designed for the task. Driving a car, skippering a yacht—everything depends on knowing what you've just done and where you are. So also in running a business or dealing in company securities.

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R. J. CHAMBERS

Common Sense, Technology and Science

Manuscript of Chambers' first in a series described as the 1989 Gordon Fellowship Lectures. Copy was found in Chambers' home study after his death in late September 1999 by his daughter Rosemary. There appears to be some missing text. Full reference details for partially referenced books and articles cited in this lecture are available in R. J. Chambers, Accounting Thesaurus, *Pergamon, 1995. Those wishing to read more of Chambers on this topic should consult 'Myths and Sciences of Accounting',* Accounting, Organizations and Society, *Vol. 5, No. 1, 1980, pp. 167–80, (reproduced in* Chambers on Accounting, *Vol. III, p. 48) and also his article, 'Positive Accounting Theory',* Abacus, *March 1993, pp. 1–26 (reproduced in* Chambers on Accounting, *Vol. VI, pp. 105–30).*

The brochure announcing the lectures noted:

> Arts and skills are learned by indoctrination and practice. But their understanding and advancement depend on the outcome of rigorous enquiry and the resultant body of reliable knowledge. Standards, principles, rules are everywhere evident. Is accounting, or can it be, based on firm principles in the same way as other pursuits?
> The 1989 Gordon Fellow Lectures were sponsored by the Deakin University School of Management between 9 August and 25 October 1989. The object of this series of lectures and discussions is to examine some ideas of scientists, technologists, practitioners and theorists, and their relevance to accounting, with particular reference to the identification of worthwhile problems and the prospect and modes of their resolution.

The human mind is capable of both great wisdom and great folly. We can give careful attention to what we see or hear, appraise it, absorb or reject it, discriminate between what is reliable and what is not on grounds that others would consider reasonable or sensible. On the other hand, we may not care to exercise similar diligence in respect of other things we encounter. We can be cautious now and gullible then; optimistic now and pessimistic then; strongly individualistic now and just one of the crowd then. We can be all of these things because we are able to regard persons, objects, beliefs and acts from different perspectives. We are imaginative. The fruits of imagination are as diverse as primitive myths, the lives of Dante, the tales of Verne or Tolkien, the inventions of Edison, the high mathematics of Einstein and the evocative blandishments of the advertising copywriter. There is scarcely any part of life that is free of the influence of our own imaginations or the products of the imaginations of others. In matters of consequence to ourselves that entail dealing or interaction with others, we must therefore be constantly on guard against confusing facts with figments or fictions. To help maintain that vigil is among the functions of scholars and institutions of higher learning.

Our ancestors, we may suppose, commanded a repository of mental and mechanical skills that they could exercise without the risk of confusing facts with fictions. In pursuit of comfortable subsistence they would use the products of observation and imagination to devise tools, to cultivate herbs, to domesticate animals. Whatever they devised could be put under test in short order. The imagination would be constrained by confrontation of imagined consequences of its exercise with real consequences—by trial and error. Spatial and temporal pockets of abundance and scarcity would evoke the ingenuity, inventiveness and foresight of men. They would have only the most rudimentary notions of what would come to be called mass, velocity, centre of gravity, friction, force, fertility, instrument and so on. Their rudimentary knowledge would be enshrined in sets of rules which would be passed from seniors to juniors as maxims, or precepts or work habits to be followed in coming to terms with the world about them. Trade knowledge and skills were for centuries, and still are, passed from mastercraftsmen to apprentices in field, forge and factory where the consequences of their exercise are most readily apparent. What survives the test of users and uses is accepted as reliable knowledge or commonsense.

Parallel with the mechanical and rural arts, there developed the skills of writing and reckoning, and a class of scribes expert in representation of things seen or imagined, by symbols on rock, clay, parchment and paper. Communication at a distance in time or space became possible. Oral traditions, precepts and rules could be given more or less permanent form. Accounts of the property and transactions of kings, priests, merchants, bankers and all kinds of organizations became in due course the upshot of this development.

There were among, or as well as, the labourers, artisans and scribes, some who speculated about the fundamental nature of things—on life generally, on the universe at large, on origins and destinies, on freedom and knowledge and goodness and justice. Speculation of this kind caught no game and baked no bread. But it was the matrix of the enormous surge of investigative, exploratory and inventive activity that we know as the Renaissance. From it would emerge the class of tutors, teachers, writers, researchers, inventors who concerned themselves with the preservation of reliable knowledge and the discovery and application of new knowledge. It was in this period of intensely innovative activity, somewhere in the fourteenth or fifteenth centuries, that double-entry bookkeeping in the Italian manner was devised, the source of modern accounting. That apart, the mariners' compass, spectacles, mechanical clocks and the printing press were invented during the thirteenth–fifteenth centuries. The sixteenth and seventeenth centuries were marked by the anatomical work of Leonardo (1452–1519) and Vesalius (1514–1564) and the astronomy of Copernicus (1473–1543), Brahe (1546–1601) and Kepler (1571–1630); the microscope and telescope were invented, Harvey (1578–1657) discovered the circulation of the blood and Leeunwenhoek (1632–1723) first observed microorganisms. In the late sixteenth and early seventeenth centuries, Francis Bacon was a voluble champion of observation and experiment as the means of advancing knowledge. And about that time there were set up, first in Italy, then in England and France, academies or societies for the discussion of natural philosophy or natural knowledge. The Royal Society of London (chartered in 1662) encouraged all kinds of discovery and invention and the circulation of discussions and descriptions of them. Its motto 'Nullius in verba' has been translated as 'Take nobody's word for it; see for yourself' (Boorstin, 1984, *The Discoverers*, London, Dent, p. 394).

Discovery led to invention and invention to new discoveries. Many of the basic arts and crafts survived, but by the nineteenth century many were transformed, into complex processes using ingenious devices, by the rising classes of technologists and professionals. As I have said, the Royal Society in its early decades fostered both discovery and invention, both being the fruit of imagination and ingenuity. But in due course, what was then called natural philosophy came to be described generally as 'science'. The growth in knowledge led to the designation of limited fields of inquiry and limited bodies of knowledge as subjects. 'Subjects' would be studied or investigated increasingly in isolation from other subjects, without regard for the wholeness or systematic nature of things. Distinctions would come to be drawn between science and art, or science and technology, or pure science and applied science.

These distinctions and demarcations may have been of no consequence, may not have arisen, but for the growth, already mentioned, of the class of tutors, teachers and writers and researchers who, for a variety of purposes, may wish to claim or to disclaim 'scientific' status, or to propagate their own ideas, or to undermine the ideas of others. A trade, vocation or profession is open to contradictory consequences, as it becomes more bookish. On the one hand, close and critical observation of practices and processes might be more instructive than rules taught dogmatically by or learned by rote from master craftsmen. Said Francis Bacon, 'lookers-on many times see more than gamesters' (1625/1907, p. 107). On the other hand, book knowledge may more readily be influenced by imagination and speculation if it is relieved of confrontation with the demands of users and uses of its products. Again, Bacon: 'the particular phenomena of the arts and nature are but a handful compared with the fragments of the unit, after they have been separated and abstracted from the evidence of things' (*Novum Organum*, 1620/1891, p. 291).

Almost all of what passes for knowledge has come under the contrary influence of these two processes—observation and imagination. In fields that have a long investigative or research tradition, imaginative ideas, hypotheses, theories, are promptly and continuously put under the test of observation. But that does not altogether close those fields against what Bacon called 'figments of the wit'. In the natural and the physical sciences there arise, now and then, new ideas and new discoveries that make their antecedents obsolete. And even in those fields where we might expect bias and human willfulness to be reduced to a minimum, there have arisen notorious cases of scientific fraud and neglect (Broad and Wade, *Betrayers of the Truth*, 1982). That, of course, only illustrates my opening observation on the coexistence of wisdom and folly.

Over the next few weeks [of these lectures] I shall consider a variety of aspects of what passes for expert knowledge and reliable processes in accounting. The practice of double-entry bookkeeping antedates the rise of some large and important fields of knowledge and practice by hundreds of years. But only over the last three generations could it be said that its ideas and processes have come under scrutiny. We should expect to find therefore, and we shall find, that among the dicta of teachers, authors of handbooks, practitioners, associations of practitioners, and others, there is much that can be called wise and much that is simply foolish; and that as in other fields the wise and the foolish coexist over long periods of time to the present.

But what is to be considered wise and what foolish?

It would be easy to use 'scientific' and 'non-scientific' in place of 'wise' and 'foolish'. I shall in fact use both sets of terms—but with quite definite connotations.

The post-Renaissance centuries have been described as the scientific age. In nineteenth-century English usage 'science' was used of what was formerly called natural philosophy. It came to connote those studies of external (non-personal) phenomena that could be brought under close examination by observation and experiment. These sciences, and physics in particular, were accorded particular esteem because of the rigour with which their study could be pursued. Workers in other directions aspired to the same esteem, it appears; for the pattern of the physical sciences became the pattern that others would try to follow. Other subjects would be considered scientific according to the degree of similarity their processes and findings would bear to those of the sciences.

On the other hand, *Wissenschaft*, the German word for science, 'included historical and classical studies as well as the natural sciences . . . The notions that [the nineteenth-century German academic system] most strongly encouraged were those of painstaking care, loving attention to detail, precision of language and of argument' (Ziman, 1968, p. 85). Exactly the same virtues, of course, were expected of the natural sciences in Britain. In effect, then, the scientific status of all kinds of inquiry subsisted not in particular groupings of things open to observation nor in particular technical methods of observation; but in the care with which things were observed, generalizations were made, and inferences were tested.

To observe, to reason and to report with care is nothing more than common sense applied to common experience. The work of science, said Max Planck, 'consists in the task of introducing order and regularity into the wealth of heterogeneous experiences conveyed by the various fields of the sense world . . . this task proves to be fully consistent with the task which we are habitually performing in our lives since our earliest infancy, in order to find our way and place in our environment . . . Scientific reasoning does not differ from ordinary everyday thinking in kind, but merely in degree of refinement and accuracy' (1950, p. 88). Or, as a philosopher has it: 'Science . . . is the attentive consideration of common experience; it is common knowledge extended and refined. Its validity is of the same order as that of ordinary perception, memory and understanding' (Santayana, 1962, p. 29).

It may be granted that one function of science and scientific inquiry is increase of understanding. But the object of understanding, in Planck's words, is 'to find our way and place in our environment'. The practical value and function of scientific knowledge is well attested by scientists themselves. Said Schrödinger: 'the primary aim of thought and action is to satisfy [man's] needs and to preserve his life . . . It is the duty of a teacher of science to impart to his listeners knowledge which will prove useful in their professions' (1935/1957, pp. 27, 29).

Clearly then, there is little or no merit in the view that scientific inquiry may or can dissociate itself from practical matters. But is it not perhaps the case that scientific work is an entirely different kind of pursuit than art or technology? Even that seems questionable from the dicta of scientists themselves. Campbell, a physicist, averred that 'nothing could be more absurd than the attempt to distinguish between science and art . . . For science, like art, seeks to attain aesthetic satisfaction through the perceptions of the senses; and science, like art, is limited by the impositions of the material world on which it works' (1919/1957, p. 227). A medical scientist has advanced equally pointed observations: 'By some the scientist is regarded as a man who, working by well tried rules of logic and experiment, has made himself independent of artistry and intuition. This is entirely false. The really great scientist is always a great artist . . . By some the artist is regarded as a man who owes little or nothing to working hypotheses or experimental tests. This is an even more dangerous fallacy' (Topley, 1940, p. 37).

The tendency towards specialization, the mastery of one segment of knowledge, may seem to some to be a characteristic feature of scientific effort. But the constraints it would impose on understanding were sensed 400 years ago by one of the early modern anatomists, Andreas Vesalius: 'I think . . . that great harm is caused by too wide a separation of the disciplines which work toward the perfection of each individual art, and much more by the meticulous distribution of the practices of this art to different workers' (1543/1960, p. 128).

And, in our own time: 'we may look at all sciences as dovetailed . . . as parts of one science . . . because we cannot know anticipatively when it may be useful, and when not, to take into account all the statements together in analysing certain correlations in a certain field' (Leurath[?], 1994, p. 9). It has transpired repeatedly that the boundaries men have set for their inquiries have turned out to be impediments to new discoveries or sources of mistaken confidence. In our generation nature herself has begun to show how mistaken it has been to exploit isolated bits of knowledge, or bits of knowledge in isolation. You may choose your own examples from the multitude of causes that have come to be championed by conservationists, reformers and protesters of many a different stripe: all because long-run or secondary consequences of new knowledge and new technology were discounted or disregarded or unknown.

Mention of the 'unknown' serves as a reminder of the temporal limits to rigorous knowledge. Eminent scientists who, by reason of long and careful thought and inquiry, are aware of how much remains unknown to them, are quite humble about their knowledge. Said Newton: 'I don't know what I may seem to the world, but as to myself I seem to have been only like a boy playing on the sea shore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me' (1727/1964, p. 60). The more arrogant, more pretentious, more ignorant might rush in where Newton feared to tread. But the humility of the eminent and the arrogance of the ignorant both serve as reminders of the purely provisional human and fallible nature of what we take as reliable knowledge.

I have quoted verbatim, from a variety of scholars and scientists, opinions that in a sense cut across many of the widely held views of people not so firmly self-disciplined. I have quoted verbatim so that you could not suppose it was I, who, for my own purposes, wished to reduce science to the commonplace. Popular belief to the contrary, there is no such thing as the scientific method: 'A scientist commands a dozen different stratagems of inquiry in his approximation to the truth' (Medawar, 1986, p. 16).

It might be supposed that if there is so much looseness or loose-jointedness in the scientific enterprise, its output would be chancy, unreliable, open to dispute. So it would be but for the willingness of scientists to submit to the test of experiment or practice the outcome of their inquiries. And as there is not just one scientific method, there is not just one form of testing. There are as many tests of an idea, a hypothesis, a theory as there are other ideas, hypotheses or theories with which, in practice, the one must be compatible. It is this compatibility or the quest for it that prompts scientists to suggest that all sciences are part of one science, and others to suggest that sciences, technologies and arts are simply different products of the same kinds of disciplined observation and thought.

That compatibility itself is a somewhat loose term is evident. But disciplined looseness (they call it tolerance in engineering) is a principle in the construction of any device. A cylinder and piston machined to exactly the same dimension would be useless components of an engine; under pressure the engine would destroy itself. So in all kinds of endeavour by which men seek satisfaction or the means of satisfaction, there are problems of design, operating constraints and output qualities that determine what shall be done and how. There are principles, rules, standards which secure that the components of devices [are serviceable].

The manuscript is incomplete. There is no handwritten page 15 but then there are two pages headed 'A' and 'B', themselves incomplete, that need a connector, perhaps the missing page.

Since men first used words and numbers and money, in some sense in conjunction they have been both the beneficiaries and the victims of those inventions. One does not need to be learned, only observant of current 'news', to know that pledges and guarantees of money, accounts of the handling of money, and the actual handling of money and money's worth, may turn out to be done well or poorly. For hundreds of years people have been shocked to find that business and public ventures they expected to be as dependable as rock turned out to be swindling sand. And no effective remedy has yet been tried.

Meanwhile the accountancy profession plies its trade, but with an undercurrent of uncertainty about its utility. And the academic branch of the profession has to a notable extent closed its eyes to the quality of what it teaches and what, in consequence, turns up in practice. On any score, this is a critical state of affairs. For if the conduct of public business and management of private business depend on calculations and messages of dubious value, all the skill and cunning that is otherwise deployed may be brought to nothing. As a matter of professional pride, specialists in these calculations and messages should not be indifferent to all this. But as I shall attempt to show, as a matter of professional pride, those specialists may find reasons or justifications or scapegoats elsewhere than in their own field. It follows that if the efforts of managers, engineers, food, textile and chemical technologists, inventors, lawyers, financiers, promoters and men in the street may be nullified by mistaken calculations and misleading messages, all have an interest in knowing where the fault lies, and why.

Over these weeks I hope to examine some of the sources of concern on the part of some people and unconcern on the part of others; for I suspect that unconcern with the by-products of indifference and neglect may be just as disastrous in financial and business and academic affairs as it is now known to be in respect of the natural environment. There is a benign overlay analogous to the ozone layer, which serves to protect social affairs from the destructive force of chaotic conflict. It is called trust; respect for truth, interpersonal honesty. Trivial breaches *do* not impair the general effect of that protective layer. But constant assault, whether individually or institutionally [is fatal] . . .

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R. J. CHAMBERS AND G. W. DEAN

Aide-Memoire*

1: PUBLICATIONS—BOOKS, MONOGRAPHS, PAMPHLETS

Items marked **AFM** included in *Accounting, Finance and Management*, 1969; items marked **CoA with roman numeral** included in *Chambers on Accounting*, in volume and at page number indicated.

BOOKS

Financial Management	September 1947, 442 pp.; 1953, 432 pp.; 1967, 433 pp.; 1986, 298 pp., Sydney, Law Book Company
The Function and Design of Company Annual Reports	1955, 322 pp., Sydney, Law Book Company (includes discussion of over 300 examples and illustrations drawn from annual reports of 145 selected Australian, U.K. and U.S. companies)
Accounting and Action	May 1957, 248 pp.; 1965, 287 pp.; Sydney, Law Book Company
The Accounting Frontier	(Chambers, L. Goldberg and R. L. Mathews, eds) in Honour of Sir A. A. Fitzgerald, 240 pp.; November 1965, Melbourne, Cheshire
Accounting, Evaluation and Economic Behavior	1966, 388 pp., Englewood Cliffs, Prentice-Hall; reprinted with essay, 'The Development of the Theory of Continuously Contemporary Accounting', Houston, Scholars Book Company, 1974, xxvii + 388 pp.; Japanese translation by Minao Nishimura published in parts in *Otemon Economic Review* commencing November 1975;

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* Edited version of R. J. Chambers and G. W. Dean, 'Aide-Memoire', sections 8–14, in R. J. Chambers and G. W. Dean (eds), *Chambers on Accounting*, Vol. VI, *Logic, Law and Ethics*, Garland, 2000. Reproduced with permission of Garland Publishing Inc.

Abbreviations

AAANZ	Accounting Association of Australia and New Zealand
AASC	Australian Administrative Staff College, Mount Eliza, Victoria
ASA	Australian Society of Accountants (antecedent of ASCPA)
ASCPA	Australian Society of Certified Practising Accountants
CAE	College of Advanced Education
CIA	Commonwealth Institute of Accountants (antecedent of ASA)
ICAA	The Institute of Chartered Accountants in Australia
USBM	University of Sydney Business Management lectures, organised by the University of Sydney Extension Board and Appointments Board

	Japanese edition, translation by Ichiro Shiobara, 1984, Tokyo, Soseishi
Accounting, Finance and Management	1969, 762 pp., Sydney, with Foreword by Arthur Andersen & Co, sponsor and distributor; also published 1969, Sydney, Butterworths; a collection of 50 articles, 1948–68
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1994 Letter to President, ASCPA, on professional aspirations and performance (no response)

7: INVITED LECTURES, CONFERENCE ADDRESSES, SEMINAR AND OTHER PRESENTATIONS

1946 USBM lectures, 'Office Management'

1947 USBM lectures, 'The Laws of Budgetary Control', 15, 22 August; 'Financial Management', six lectures, September–October

1948 Institution of Engineers of Australia, Engineering Management Branch, Sydney, 'Budgetary Control', 27 May; also listed under 2: ARTICLES

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USBM lectures, 'The Social Responsibilities of Management', six lectures, August–September

Institute of Industrial Management, Newcastle, 'Australian Secondary Industries Since the Depression', November

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Federal Institute of Accountants Educational Society, Sydney, 'Accountants and Managers', mimeograph by the Society, August

University of Sydney, comment on CIA endowed lecture by F. Sewell Bray, 20 October

Australasian Congress on Accounting, Sydney, comment on T. A. Hiley, 'Widening responsibilities of accountants', November; also listed under 4: ESSAYS, EDITORIALS, ADDRESSES, MINOR ARTICLES, NOTES

1950 Sydney Junior Chamber of Commerce, 'The Problems of Depreciation With Rising Price Levels'

University of Melbourne, University of Adelaide, CIA Annual Research Lectures, 'The Relationship Between Accounting and Financial Management', 21, 22 June; **AFM**; **CoAi**, p. 5

1951 CIA, Sydney Division, 'Accounting and Inflation', 'Effects of Inflation on Financial Strategy', 'Financial Practice and Fiscal Policy', three lectures, April–May; **AFM**; **CoAiv**, pp. 14, 24, 33

University of Queensland, CIA Sixth Annual Research Lecture, 'Accounting and Business Finance', 24 July; **AFM**; **CoAi**, p. 29

1952 Sydney Junior Chamber of Commerce, 'Modern Developments in Accounting Theory and Practice', 18 February

Sydney Junior Chamber of Commerce, 'Inflation and Accountancy', March

USBM lectures, 'The Limitations of Conventional Accounting', August

Food Technology Association, three lectures on financial administration, November

1953 USBM lectures, 'Australian Facilities for Developing Executive Abilities', June; 'Communications Between Management and a Company's External Participants', September

Ivory Tower (Faculty of Economics, University of Sydney), 'The Study of Accounting and of Economics', 8 July

Australian Chartered Accountants Research Society Congress, Medlow Bath, comment on paper, 'Accounting in . . . Inflation', 17 July

Statistical Society of N.S.W., Sydney, 'Economic Accounting—a New Application of Statistics', 17 September

ASA, Wollongong Branch, 'Business Finance and the Accountant', November

1954 Sydney Junior Chamber of Commerce, 'Company Reports and Industrial Relations', 22 April

First ASA Convention, Adelaide, 'Capital for Private Enterprise Under Existing Economic Conditions', 1 June; also listed under 2: ARTICLES

Bankers Administrative Staff College, Kirribilli, 'Delegation, Control and Accountability', 23 August

Johnson and Johnson Executive Forum, Sydney, 'Pounds, Shillings and Sense', 22 November

1955 ASA, Wollongong Branch Annual Meeting, 'What is an Accountant?', 23 February

Sydney Junior Chamber of Commerce, 'Accounting and Monetary Instability', 3 May

Economic Society of Australia and New Zealand, Sydney, 'Capital Erosion', 16 September

University of Tasmania, Hobart, ASA Research Lecture; ASA, Launceston, 'The Formal Basis of Business Decisions', 20, 22 September; **AFM**; **CoAi**, p. 53

USBM lectures, 'Provision of Permanent Capital', 4 October

Bankers Administrative Staff College, Kirribilli, 1–4 November

1956 ASA, Sydney, members' refresher course, 'Methods of Financing Business Enterprises', June

University of Sydney, Open Day, 'How to Fake Accounts—Some Notable Examples', 21 July

1957 ASA, Wollongong, February

ASA, Newcastle, annual general meeting, 'Company Formation, Conversion and Financing', 15 March

USBM lectures

University of Sydney, Open Day, 'How to Lose Money on the Stock Exchange', 27 July

University of Melbourne, ASA Research Lecture, 'The Implications of Asset Revaluations and Bonus Share Issues', 2 October; **AFM**; **CoAi**, p. 73

1958 Australian Institute of Management, Newcastle, 'Accounting and Action', 25 March

East Sydney Rotary Club, 'Accounting and Business Behaviour', 1 May

ASA National Convention, Sydney, comment, 'The Influence of Economic Forces on Accounting', 5 May

Sydney University Extension Board, Courses for Professional Engineers, 'Engineering Finance', 8 Lectures, 12 June–31 July

AASC, Mount Eliza, 'Accountability in the Public Company', 13 August, 9 October

USBM lectures, 'Contemporary Developments in Business Finance', 30 October

1959 The Institute of Management Sciences, national meeting, Chicago, 'Measurement and Misrepresentation', 5 June; **AFM**; **CoAiii**, p. 17

University of Chicago Graduate School of Business, in public lecture series—Accounting: Changing Patterns—'Accounting Abroad', 28 October

1960 ASA Divisional Council, 'Accounting Education and Training Abroad', after-dinner address, 4 February

ASA, Sydney, 'A True and Unfair View' (of accounting in the U.K. and the U.S.A.), luncheon address, 16 March

University of Sydney Economics Graduates Association, 'On Getting Along by Degrees', 11 May

Sydney Junior Chamber of Commerce, 'Takeover Bids', 19 May

AASC, 'Accountability in the Public Company', 12 June, 25 September

Sydney University Union, Trinity dinner, guest speaker, 27 June

Australian Institute of Management Conference, opening address, 'Information Processing Systems', Craigieburn, Bowral, 19 August

Australian Launderers Convention, 'Trends in the Management of Medium-Sized Business', 10 October

Junior Australian–American Association, 'Business Education Abroad', 26 October

Australian Institute of Management Supervisors Forum, 'The Meaning of Management', 10 November

1961 ASA, Wollongong, 'Trends and Developments in Accountancy Overseas', February

University of Sydney Department of Tutorial Classes, Residential School for BHP Executives (Women's College), 'The Nature of Industrial Organization—Costs And Industry', 6 February

AASC, Mount Eliza, 'Accountability', 5 March, 18 June, 1 October

University of Adelaide, ASA Research Lecture, 'Towards a General Theory of Accounting', 2 August; **AFM**; **CoAv**, p. 29

John P. Young & Associates Cost Reduction Conference, Sydney, 'Cost Reduction in the Use of Funds', 15 November

1962 University of Tasmania, 'The Resolution of Some Paradoxes in Accounting', 30 April; also ASA, Launceston, May; University of Malaya, 9 July; University of British Columbia, 23 November; **AFM**; **CoAv**, p. 75

University of Tasmania, honours candidates seminars, April–May

Economic Society of Australia, Tasmanian Branch, address, May

ASA, Singapore, luncheon address, 'Future (ASA) Professional Qualifications and Standards', 9 July

AAA Northeast Regional Convention, Cambridge, Mass., 'Non-Comments on Non-Accounting', 6 October; **AFM**; **CoAi**, p. 99

University of Chicago, courses, 'Asset Accounting'; 'Modern Accounting Thought', seminars on accounting theory; October–November

University of Illinois, address to students and staff, 'Towards a General Accounting Theory', 1 November

Illinois Conference of Accounting Teachers, De Paul University, Chicago, 'Changes in Accounting Theory', 9 November; **CoAiii**, p. 33

University of Chicago, Institute of Professional Accounting workshop, 'Why Bother With Postulates?', 13 November; **AFM**; **CoAiii**, p. 51

Tulane University, New Orleans, student seminar, 'The Role of Theory in Practice and Learning', 19 November

Northwestern University, Chicago, Accounting faculty discussion, 'Boundaries of the Accounting Field', 20 November

University of Washington, Seattle, address to senior students and staff, 'A Framework of a General Theory of Accounting', 21 November

University of British Columbia, Vancouver, staff seminars, 'Framework for Accounting Theory'; 'Accounting education', 22 November

1963 Economic Society of Australia and New Zealand Symposium, Sydney, 'Post Mortem on Australian Company Losses', 15 March (MS)

Rotary Club of South Sydney, 'Lore and Profits', 11 March

Sydney University Pacioli Society, 'Some Observations on *The Basic Postulates of Accounting*' (Moonitz, 1961), 23 April

N.S.W. Public Service Accounting Officers Group, 'Government Accountability', 29 May

AASC, Mount Eliza, 14 July, 13 October

Canberra Seminar on Administrative Studies, 'The Role of Information Systems in Decision Making', 15 August; **AFM**; **CoAi**, p. 125

University of Sydney, 'Financial Information and the Securities Market', ASA endowed lecture, 26 September; **AFM**; **CoAi**, p. 137

Bankers' Institute of Australia Symposium, Sydney, 'Postmortem on Australian Company Failures', 15 October

Rotary Club of Hurstville, 'Company Lore and Profits', 18 November

ABC Radio, interview on company losses and anachronistic accounting, December

1964 Australasian Association of University Teachers of Accounting, second conference, Canberra, 25–27 January, 'The Moonitz and Sprouse Studies on Postulates and Principles', *Proceedings*, pp. 34–54; **AFM**; **CoAiii**, p. 64

Australian Society of Security Analysts, Sydney, 'The Adequacy of Company Reporting', 11 February

ASA Newcastle Branch Conference, 'The Accountancy Profession and Recent Company Failures', 6 March, 10 pp.

AASC, Mount Eliza, 12 March

Australian Shareholders' Association, Sydney, 'The Shareholder and Company Accounts', April

Rotary Club of North Sydney, 'Companies Unlimited', 16 April

University of Tasmania, seminars, July

ASA, Hobart, Launceston, 'Accounting 1984', 20 July

Canberra Seminar on Administration (Australian National University), 'The Role of Universities in Administrative Education', 14–16 August, (MS 5 pp.)

USBM lectures, 'The Efficiency of Administrative Structures', four lectures, September

AIS Technical Society, Port Kembla, 'Fallacies in Company Accounting', 18 September; **AFM**; **CoAi**, p. 165

Rotary Club of Kingsgrove, 'Human Efficiency in Business', 21 September

1965 Investment in Australia Symposium, comment, 'Are the Stock Exchanges in Australia Meeting Their Challenges?', 18 February; **AFM**; **CoAi**, p. 185

University of Western Australia Adult Education Board, 'Published Financial Reports and National Productivity', 20 February; **AFM**; **CoAi**, p. 191

Australasian Association of University Teachers of Accounting, 'Professional Education and the Vatter Report', *Proceedings* of conference, Melbourne, May, 17 pp.; **AFM**; as to part, **CoAii**, p. 31

N.S.W. Computer Society, Sydney, 'The Firm as an Information Complex', 29 June

AASC, Mount Eliza, 16 July, 15 October

University of Sydney Department of Adult Education, Newcastle, 'The Efficiency of Administrative Structures', four lectures, September–October

ASA, Wollongong, end of year dinner, 'The Future of Accounting', 19 November

1966 Economic Society of Australia and New Zealand, N.S.W. Branch, 'Company Losses—Bad Times or Bad Management?', 18 February

London School of Economics, Accounting Staff Seminar, 'Accounting, Evaluation and Economic Behaviour', 1 June

AAA Annual Conference, Miami, 'Prospective Adventures in Accounting Ideas', 23 August; **AFM**; **CoAii**, p. 67

Michigan State University, Distinguished Accountant Series, videotape, 'The Process of Theory Formation in Accounting', 20 September

Fifth Hayden Stone Forum on Accounting, New York University Graduate School, 'Why Worry About Accounting?', 10 November; **AFM**; **CoAi**, p. 205

University of California, Berkeley, October–November, senior student course, 'Modern Accounting Thought' (Sprague onwards)

University of Alabama, Tuscaloosa, 3–4 November, graduate seminar, 'Blueprint for a Theory of Accounting'; Beta Alpha Psi, 'Developments in Accounting Theory'; senior undergraduate seminar, 'Why Bother with Postulates?'; faculty seminar, 'The AAA Statement of Basic Accounting Theory'

University of California, Los Angeles, Round Table, 'Problems in Income Measurement', 19 November

MBA Associates, University of California, Berkeley, 'Business Education in Australia', 30 November

1967 Stanford University, staff and student seminars (on measurement, education, a general theory), 5–12 January

Berkeley Symposium on the foundations of financial accounting, 'The Foundations of Financial Accounting', 13 January; **AFM**; **CoAv**, p. 110

Beta Alpha Psi, Lambda Chapter, Oakland, 'Audit Under Audit', 13 January; **CoAii**, p. 81

Stanford University, staff, MBA and PhD seminars, on objectivity, relevance, additivity, 16–24 January

University of Michigan, Ann Arbor; senior students seminar, 'General Features of an Accounting System'; PhD candidates seminar, 'International Comparisons in the Development of Accounting Theory', 25 January; public lecture, 'Reality and Illusion in Accounting, Finance and Economics', 26 January; **AFM**; **CoAi**, p. 215

University of Washington, Seattle, doctoral seminar, four sessions, on development and substance of continuously contemporary accounting; 'Evaluation of Alternative Accounting Systems' (re: appendix to Berkeley Symposium paper, January, see above), 2–23 February

University of Alberta, Edmonton, public lecture, 'The Relationships Between Accounting, Finance and Management', 13 February; **AFM**; **CoAi**, p. 225

University of Saskatchewan, Saskatoon, faculty and senior student seminar, on dealing with intangibles, 15 February

University of Washington, Seattle, faculty seminar, 'Some Tentative Ideas on Methodology', 16 February; **CoAiii**, p. 179

Washington State CPA Society, Seattle, dinner address, 'The Crisis in Accounting Practice', 16 February

University of Oregon, Eugene, faculty and student colloquium, 'The Firm as an Information Network', 20 February

Washington State University, Pullman, faculty and student seminars, 21 February

University of Washington Graduate School of Business Administration, open lecture, 'The Concept of the Firm and the Integration of Disciplines', 24 February

ASA Wagga Wagga Accounting Convention, 'Avenues for Specialization in the Accounting Profession', 8 April

Commonwealth Public Service Board Seminar on administration, management and training, Canberra, 'Developments in Management and Organization Theory', 18 May

Australian Chartered Accountants' Research Society Fifteenth Annual Congress, Canberra, panel member, discussion, 'Chartered Accountants: Today and Tomorrow', 24 June

AASC, Mount Eliza, 'Accountability in the Public Company', 11 July, 10 October

Victoria University of Wellington 16th Annual Seminar, 'New Pathways in Accounting Thought and Action', 25 August; **AFM**; **CoAii**, p. 92

1968 Qantas Station Managers' Symposium, Sydney, 'What Makes a Manager?', 9 February

ASA, Financial management lectures, 'The Role of the Financial Executive in Planning Corporate Growth', 7 March

General Management Group, Sydney, 'Stereotypes, American and English', 8 March

Australian National Economics and Commerce Students' Association Conference, University of New South Wales, 'Alternative Accounting Systems—an Evaluation', 21 May

Australasian Association of University Teachers of Accounting, annual conference, Newcastle, 'The Linked Logics of Pedagogy and Practice', 12 August; **AFM**; **CoAii**, p. 111

AASC, Mount Eliza, lecture (accountability), 7 October

1969 Sydney Legacy Club, 'Teaching and Learning Management', 13 March

University of Sydney Pacioli Society, 'It Should Not Be Difficult to Reach Agreement on Accounting Principles', 25 March

Fifth Pan-Pacific Congress of Real Estate Valuers and Appraisers, Sydney, 'Valuation of... Assets', 14 April; also listed under 2: ARTICLES

ASA and ICAA joint seminar, 'Profit Objectives and Continuity', 22 April

Canberra Seminar on Administrative Studies, 'Financial Information Systems', 19 May; **CoAi**, p. 242

Commonwealth Department of Supply Basic Management Course, 'The Management Process', Terrigal, 30 June

Commonwealth Industrial Gases Staff Finance Seminar, Wahroonga, 'Accounting Philosophy', 5 August

ASA South Australian Division Convention, Flinders University, Adelaide, 'What's Wrong With Financial Statements?', 29 August; **CoAii**, p. 147

ASA Convention, Canberra, 'The Role of Tomorrow's Accountant', 31 August; **CoAi**, p. 248

Macquarie University, student seminar, 'Interperiod Allocation of Income Tax', 18 September

AASC, Mount Eliza, 6 October

University of Sydney, 'Empirical Research in Accounting', staff seminar paper, 4 pp., 8 October

ASA, Wollongong Branch, dinner address, 27 November

1970 Monterrey Institute of Technology, Monterrey (Mexico), 23, 24 February; undergraduate lecture, 'The Place of Accounting in Administration'; graduate lecture, 'Varieties of Accounting Research'; **CoAiii**, p. 269; faculty and practitioners seminar, 'Accounting Research and Technology'; **CoAiii**, p. 259; faculty seminar, 'Accounting Theory and Theories'

North Texas State University, Denton, faculty and graduate students colloquium, 'Second Thoughts on Continuously Contemporary Accounting', 26 February; **CoAv**, p. 147

University of Florida, Gainesville, various student lectures, 1–25 March

University of Florida Accounting Theory Symposium, 'The Commercial Foundations of Accounting', 12 March; **CoAv**, p. 165

University of Virginia Accounting Forum, Charlottesville, 'Legerdemain in the Ledger Domain', 26 March

Georgia State University and Beta Alpha Psi, Atlanta, student convocation, 'Accounting—From a Logical Point of View', 30 March; **CoAiii**, p. 239; Price Waterhouse Distinguished Lecture, 'Patchwork Principles or a New Code?', 30 March; **CoAii**, p. 157

University of Kansas, Lawrence, Senior student lectures, 1 April–21 May

Tulane University, New Orleans, seminars, 'Continuously Contemporary Accounting for Better Decisions'; 'Recent Uses of Research Methodology in the Accounting Theory Literature', 17, 18 April

Ohio State University, Columbus, faculty colloquium, 'Guesswork Today, Accounting Tomorrow', 23 April

University of Minnesota, Minneapolis, seminar, 'Styles of Research in Accounting', 1 May

Washington State University, Pullman, 'Accounting and Economic Choice', 4 May

University of Washington, Seattle, student seminar, 'The Development of the Idea of Resale Price Accounting', 5 May

Wichita State College, 'A Day with Professor Chambers' (varied staff and student discussions), 15 May

University of Kansas, Asset Valuation and Income Determination Symposium, 'Evidence for a Market Selling Price Accounting System', 22 May; **CoAv**, p. 184

Bowling Green State College and Beta Alpha Psi, Bowling Green, faculty and students address, 'A General Theory of Accounting', 27 May

Pennsylvania State College, University Park, 'Second Thoughts on Continuously Contemporary Accounting', 28 May

Ontario Institute of Chartered Accountants Annual Conference, York University, Toronto, 'Financial Reporting and Administrative Accounting—Harmony or Conflict?', 11 June; **CoAi**, p. 286

1971 Sydney Rotary Club, 'Directors, Investors, Auditors and the Law', 19 January

Waseda University, Tokyo, lecture course, on selling-price-based accounting, to senior students, March–June

Kobe University of Commerce, Kobe, 'The Case for Continuously Contemporary Accounting', 7 June

Soka University, Tokyo, address to students, 'Business, Economics and Accounting', 28 June

Hitotsubashi University, Tokyo, 'The Pollution of Accounting', 30 June

University of Canterbury, Christchurch, Department of Extension Studies, Foundations of Business Policy Seminars, 'Managerial Decision Making', 4 August

University of Canterbury, Department of Accountancy, various lectures and seminars as Erskine Fellow, August

New Zealand Society of Accountants, Otago Branch, 'The Pollution of Accounting', 5 August

Otago University, seminars, 'The Proof of the Pudding...'; 'A Profession Without Keel or Rudder', 6 August

Victoria University of Wellington, staff and students seminar, 10 August

University of Auckland, honours seminar; 11 August; senior students lectures, 11, 12 August

Australasian Association of University Teachers of Accounting Annual Conference, Christchurch, 17 August, 'The Anguish of Accountants'; **CoAii**, p. 176

1972 Law Society of New South Wales Seminar on the *Companies (Amendment) Act, 1971*, '*The Companies (Amendment) Act, 1971*—Accounts and Audit', Sydney, 26 May (MS 27 pp.)

Kabeiroi of the University of Sydney, 'Stock Market Ecology', 20 July

Institute of Chartered Accountants in Australia, discussion group, 'Real Time Accounting', 15 August

1973 University of Sydney, graduation ceremony address, 'Prospect on Graduation', 14 April; **CoAii**, p. 185

Sydney University Pacioli Society, 'Securities and Obscurities', 9 May

Institute of Chartered Accountants in Australia, N.S.W. Branch, 20th Annual Congress, Surfers Paradise, 'What Should Tomorrow's Accountants Be Taught?', 2 June

ASA Queensland State Convention, Mount Isa, 'Mining, Taxing and Accounting', 9 June

Chartered Accountants Students Society, Twelfth Annual Congress, Blackheath, 'What Does a Balance Sheet Say?', 16 June (MS 4 pp.)

University of New South Wales, seminar, 'Observation as a Method of Inquiry—the Background of *Securities and Obscurities*', 28 August; **CoAiii**, p. 386

University of Queensland, seminar, 'Empirical Research—in Accounting?', 7 September

University of Tasmania, seminar, 'Research Methods in Accounting'; lecture, 'Continuously Contemporary Accounting', 18 September

ASA, Hobart, 'A Case for Reform of the Law of Company Accounts', 19 September

1974 ASA Convention, Canberra, 'Management and Accounting—1975 and Beyond', 18 March (ASA tape); **CoAi**, p. 295

Victoria University of Wellington, staff and student seminars; discussion with Challenge Corporation management, 22 July

University of Waikato, seminars with staff and students, 24 July

New Zealand Society of Accountants, Cost and Management Accounting Division, one-day seminars, 'Inflation and Business', Wellington, Christchurch, Auckland, 23–26 July, working dossier, 52 pp.

AASC, Mount Eliza, 'Accountability of the Directing Authority', 29 July

ASA Southern Suburbs Group, 'Inflation Accounting', 30 July

University of Newcastle, student seminars, 20 September

University of New England, honours candidates, 'Development of Accounting Thought'; faculty seminar, 'Accounting Research', 10, 11 October

Macquarie University, senior candidates seminar, 22 October

1975 ASA, Geelong Branch Annual Meeting, 'The Accounting DTs' (double-talk and double-think), 27 February; **CoAii**, p. 219

ASA National Professional Development Course, two-day seminars, 'Accounting for Inflation', Melbourne (6, 7 March), Adelaide (17, 18 March), Sydney (29, 30 April), Wagga Wagga (18, 19 June); working dossier, 80 pp. (extension of N.Z. dossier, July 1974)

ICAA Student Society, Perth, 'A Funny Thing Happened on the Way to the Counting House', 21 March; **CoAii**, p. 215

ICAA Western Australian Branch Annual Congress, Bunbury, 'A Critical Examination of Australian Accounting Standards', 22 March; **CoAii**, p. 224

Electricity Supply Association of Australia Conference, Hobart, 'Inflation Accounting and . . . the Electricity Supply Industry', 6, 7 May; **CoAiv**, p. 138

Sydney Technical College, School of Business and Administrative Studies, Presentation of Awards, guest speaker—'Adventures for the Educated', 17 June

Australian Institute of Management Annual Finance Seminar, Sydney, 'Accounting, Inflation and Taxation', 29 August (MS 9 pp.)

Ballarat School of Mines and Industries, student and staff (Ballarat, Bendigo, Warrnambool and Geelong colleges) lecture and discussion, 'Accounting for Inflation—the Alternatives'; ASA Ballarat, luncheon address, 'Continuously Contemporary Accounting', 12 September

Australian Retailers' Association First Annual Conference, Canberra, 'Retailing and Inflation', 15 September, 6 pp.

1976 ASA National Professional Development Course, two-day seminars, 'Accounting for Inflation', Hobart (24, 25 February), Melbourne (2, 3 March)

ASA Northern Rivers Group (Lismore), 'Inflation Accounting', 16 March

AASC, Mount Eliza, 'Accountability of the Directing Authority', 23 March

Northern Rivers CAE, 'Inflation Accounting', 30 April

Sydney University Extension Board, 'Inflation, Business Finance and Taxation', 12 May

ASA, Sydney Southern Suburbs, 'Inflation Accounting', 18 May

ASA South Australian Branch Public Accountants Group Convention, Goolwa, 'Current Value Accounting—CoCoA or Repco?', 29 May

ICAA, Adelaide, luncheon address, 'Persistent Dilemmas', 7 June

Sydney, Graduate Business School Club, luncheon address, 'The Impact of Inflation on Business, and the Background to the Present Concern', 8 July

Sydney, Technical Education Teachers Conference, 'Inflation Accounting', 9 July

AAA Doctoral Consortium, Atlanta, visiting faculty, 'The Pursuit of Excellence in Scholarship; Broad Brush or Nuts and Bolts—Alternative Development Programs', 20 August

Beta Alpha Psi National Meeting, Atlanta, featured speakers, Sterling and Chambers, 'Prospects of Progress', 24 August

AAA Annual Meeting, Atlanta, 'Accounting Research and Security Prices—State of the Art' (with Beaver, Gonedes, Briloff), 24 August

University of Alabama, Tuscaloosa, students and Beta Alpha Psi, 'Current Value Accounting'; doctoral workshop, 'Accounting Research—Styles and Opportunities'; colloquium, 'Accounting for Inflation—Part or Whole?', 31 August–2 September

Texas A&M College, College Station, Thomas W. Leland Lecture, 'Asset Valuation: One Principle, or Take Your Pick?'; videotape on 'Blueprint' and subsequent work; financial management lecture, business and professional audience, 'Asset Valuation and Financial Realism', 7, 8 September

Louisiana State University, Baton Rouge, student address, 'Some Fundamental Fundamentals in Accounting'; open address, 'Inflation Accounting and Other Bugaboos'; graduate theory students, 'Accounting Principles: Politics or Science?', 10–14 September

Indiana University, Bloomington and Indianapolis, faculty seminars, 'Inflation Accounting'; 'Accounting for Nonvendibles', 16, 20 September

Ohio State University, Columbus, Accounting Research Colloquium, 'The Functions of Published Financial Statements'; Beta Alpha Psi discussion, 'Accounting Practice, Education and Research', 23, 24 September

St Francis College, Brooklyn, faculty/student seminar, 'Accounting for Inflation'; accounting theory class, 'Life with CoCoA'; accounting majors, 'Progress in Accounting—From Grass Roots or Cloud 9?', 27–29 September

George Washington University, Washington, 'Accounting for Inflation—the Current Debate'; 'Accounting Research: Styles and Opportunities'; 'The Functions of Accounting and Financial Statements'; 'Concepts and Standards: The Roles of Observation and Reason', 1–5 October

Virginia Polytechnic and State University, Blacksburg, graduate theory seminar, 'Continuously Contemporary Accounting'; ninth annual seminar on accounting education, 'Back to Fundamentals in Accounting Education'; faculty/doctoral students seminar, 'Research on CoCoA'; Beta Alpha Psi and practitioners, 'World Developments Towards Current Value Accounting', 7–11 October

University of New Mexico, Albuquerque; accounting theory seminar, 'Inflation Accounting', illustrated; international marketing students, international financial comparisons, 13 October; Society of CPAs of New Mexico, 'Accounting for Inflation', 14 October

University of Washington, Seattle, Faculty, Beta Alpha Psi and CPAs, 'Inflation Accounting'; Accounting Development Fund Board, 'Collaboration Between Professionals and Academics'; regional educators seminar, 'The Derivation of Accounting Principles', 19–22 October

City University of New York, Emanuel Saxe Distinguished Lecture, 'Fair Financial Reporting—in Law and Practice', 28 October; **CoAii**, p. 241

Financial Accounting Standards Board, Stamford, members and staff, 'An Accounting Framework', illustrated, 29 October

University of Lancaster, faculty and student seminar on current cost accounting and continuously contemporary accounting, 2 November; faculty seminar, regional academics, videotaped, 5 November

Accounting Standards Steering Committee, London, 'Continuously Contemporary Accounting', illustrated, 3 November

London Graduate School of Business, open address, 'Current Cost Accounting—a Non-Inflation Accounting System', 8 November

Manchester District Society of ICAEW, 'CoCoA and Current Cost Accounting', 9 November

New Orleans, Beta Alpha Psi induction; response—'Professional Excellence?—the Persistence of Makeshifts', 17 November

University of Alabama Accounting Research Convocation, Tuscaloosa, 'Accounting Principles and Practices—Negotiated or Dictated?', 18 November; **CoAii**, p. 249

1977 Victoria University of Wellington, Faculty seminar, 'CoCoA', 29 March

Manawatu Accountants Students Society Invitation Lecture, Massey University, Palmerston North, 'Accounting for Inflation', 30 March; **CoAiv**, p. 257

Caulfield Institute of Technology, faculty seminar on current cost accounting, Tyabb, 'CoCoA', 30 April

ASA Victorian and South Australian Public Accountants Conference, Warrnambool, address, 28 May

John Fairfax Group, discussion, 'Group Application of Current Cost Accounting', 16 June

ASA London Group Formation, address on ASA developments and prospects, 29 September

Fourth International Conference on Accounting Education, Berlin, *Proceedings*, 'Inflation and the Reform of Accounting Education' (proposed an international association of teachers associations), 6 October; **CoAii**, p. 271

Institute of Cost and Management Accountants of Pakistan, Karachi, Shoaib Memorial Lecture, 'The Integration of Managerial and Financial Accounting', 20 October; **CoAi**, p. 327

Swinburne College of Technology, Faculty of Business, 'Accounting Methods During Inflation', videotaped, 8 November

ASA Victorian Division State Congress, Traralgon, panel discussion, 'The Future of the Accountancy Profession', 26 November

1978 ASA Townsville and Townsville Rotary Club, 'Unemployment, Inflation, and All That', 21 March

ASA Queensland Division, luncheon address, 'The Society and the Profession—Past and Future', Brisbane, 22 March

Queensland Institute of Technology, graduation address, 5 April

Executive Leasing (Sydney), Inflation Accounting Seminar, 'Continuously Contemporary Accounting', 28 April

ASA, Sydney, luncheon address, 'The Future of Accounting—an Accountant's Manifesto', 2 May 2; **CoAii**, p. 313

ASA Western Australian State Congress, Busselton, 'The Construction of Accounting Standards', 5 May; **CoAii**, p. 287

Accounting Researchers International Association Symposium, Houston, 'The Taxi Company Under CoCoA', 26–27 May; **CoAv**, p. 311

1979 Sydney University Pacioli Society, 'Company Accounting Standards', on the report of the Accounting Standards Review Committee, 15 March, (MS 4 pp.)

ASA South-East Asia one-day Professional Development Course, Port Moresby, Hong Kong, Penang, Singapore, Kuala Lumpur; 'Advancing Accounting in the 80s—Accounting, Finance and Management in Changing Markets; Integrating Accounting and Financial Management; Standardizing Information for Management and Regulation'; illustrated; three summaries in MS, 40 transparencies; 6–25 April; digested in *Journal of Accounting*, Department of Accounting, University of Singapore, Vol. 1, No. 1, October 1979

Caulfield Institute of Technology, 'The Inflation Problem, and the Case for CoCoA', presentation based on South-East Asia Professional Development Course (illustrated, videotaped), 23 May

ASA Joint South Australian, Victorian and N.S.W. Public Accountants Convention, Mildura, dinner address, 'The Future of the Profession', 1 June

UCLA Conference on Accounting, Organizations and Society, Los Angeles, 'The Myths and the Science of Accounting', 19 July; **CoAiii**, p. 483

UCLA/Peat Marwick & Co Partner Development Program, Coto de Caza, 'Skill, Duty and Image—a Professional Brew', 8 August, 30 pp.

ASA Northern Suburbs Professional Development Committee, 'Challenges Facing Accountants in the 1980s', 22 August

ASA Young Accountants Group, Sydney, 'Horizons for Young Accountants—Academic Changes and Opportunities', 29 August

ASA Silver City Accountants Silver Anniversary Convention, Broken Hill, 'Application of Inflation Accounting in the Mining Industry', 15 September, (MS 18 pp.); **CoAv**, p. 355

Group of 100, Eastern Division, Sydney, discussion panel, 'The Chambers Report on Accounting Standards; Foreign Currency Accounting; Equity Acounting for Investments'; after-dinner address, 'Improved Communication Between the Academic and Business Worlds', 29 October (MS)

1980 ASA N.S.W. State Congress, Coffs Harbour, 'Government Regulation' (of the accountancy profession), 15 March, (MS 8 pp.); **CoAii**, p. 339

ICAA Victorian Congress, Hobart, 'Should Accounting and Audit Standards Be Relaxed for Small Business?', 30 March; **CoAii**, p. 347

University of Tasmania, student and staff seminar, 'Continuously Contemporary Accounting', 31 March

ASA Regional Convention, Rockhampton, 'Company Accounting Standards', May; **CoAii**, p. 351

Capricornia Institute of Advanced Education, Rockhampton, senior student seminar, 'Selling Price Accounting', May

Australian National University, seminar, 'Serviceable Accounting Standards', 30 May

University of Illinois, Champaign-Urbana, course of lectures on income and income determination, August–November; accountancy forum, 'Current Value Accounting, Pronouncements and Research Prospects' (MS 11 pp.), October; Round Table, 'The Future of Accounting Education' (MS 7 pp.), 24 October

Michigan State University, East Lansing, seminar, 'Groundwork for Accounting Standards', 30 October; **CoAv**, p. 373

University of Michigan, Ann Arbor, seminar, 'Groundwork . . .', 31 October

Ohio State University, Columbus, 'Groundwork . . .', 6 November

University of Chicago, faculty seminar, 'Groundwork . . .', 13 November

Illinois Accounting Teachers' Conference, luncheon address, 14 November

Financial Accounting Standards Board, Stamford, members and staff, 'Accounting Measurement and Changing Prices', 21 November

University of Indiana, Bloomington, doctoral seminar, 'Accounting Theory'; faculty seminar, 'Groundwork . . .', 3, 4 December

1981 ASA State Congress, Sydney, 'Regulation—the Future of the Accounting Profession', 12 February; **CoAii**, p. 363

Sentry Insurance Group, Sydney, 'Uses and Misuses of Figures', 26 June

AAANZ Conference, Canberra, 'Different Approaches to Current Value Accounting—Comment on a Paper by P. W. Bell', 24 August

Kuring-gai College of Advanced Education, lecture, 'Price Variation Accounting', 22 September

1982 Public seminar, Melbourne, Sydney—The Campbell Report in Perspective, 'Development and Enforcement of Accounting Standards', 1, 2 March

ASA National Congress, Adelaide, congress chairman and rapporteur, 2–7 April

University of Cape Town, lectures on income, April–May; staff and student seminar, 'The Standard Setting Process in Australia', 28 April; workshop, 'The Relevance of Stock Market Research to Accounting [Research]', 3 May; staff and student lecture, 'Responses to Financial Information', 11 May; financial accounting class, 'Accounting for Inflation', 12 May; honours seminar, 'Income determination', 12 May

Chartered Accountants Western Cape Regional Association, afternoon address and evening discussion, 'Accounting in Disarray', 6 May

University of Melbourne, honours seminar, 'Research Methods and Research in Accounting'; staff seminar, 'Cost/Benefit Analysis of Accounting Alternatives', 30 June

1983 James Cook University, Townsville, student seminars, 16, 18 March; staff seminar, 18 March

University of Edinburgh, lectures on income, theory construction, 10–15 April

University of Edinburgh and Heriot Watt University, joint staff seminar, 13 April

Deloitte Haskins & Sells Distinguished Lecture, University of Edinburgh, 'Accounting—"One of the Finest Inventions of the Human Spirit"', 14 April; **CoAv**, p. 151

University of Glasgow, staff seminar, 'Grounds for CoCoA', 20 April

University of Saskatchewan, presentation to faculty and graduate students, 11 May

University of Alberta, Edmonton, seminar, 'Groundwork for Accounting Standards, or, 30 Reasons for CoCoA', 12 May

University of New England, departmental seminar, 'Chambers' Current Research'; senior student lecture, 'CoCoA'; departmental seminar, 'Accounting Education—the Future'; auditing and professional practice students seminar, 'True and Fair'; faculty seminar, 'Accounting, Microeconomics and Macroeconomics'; 27, 28, 29, 30 September

Kuring-gai College of Advanced Education, senior students seminar, 'Continuously Contemporary Accounting' (videotape), 8 November

Australian National University, student seminar, November

1984 University of Otago, general and honours seminars and lectures—'Entry v Exit Values', 'Approaches to the Formulation of Accounting Theory', 'Research Possibilities in Accounting and Finance', 9–20 April

New Zealand Society of Accountants (Dunedin Branch), luncheon address, 'The Case Against CCA', April

1985 Simon Fraser University, Vancouver, twelve seminars on concepts of income, wealth and capital, 9 September–10 October

Simon Fraser University, Vancouver, executive forum, 'Who Wants (or Needs) Good Financial Reporting?', 26 September

University of British Columbia, faculty and PhD candidates seminar, 'Grounds for CoCoA'; 27 September

Institute of Chartered Accountants of British Columbia, 'Will Technology Make Accounting Statements Obsolete?', 30 September

University of Utah, Salt Lake City, faculty and student seminar, 'Grounds for CoCoA', 4 October

Simon Fraser University, Vancouver, seminar, with Haim Falk, 'The Serviceability of Financial Information', 10 October

1986 South-East Asian University Accounting Teachers Conference, Singapore, keynote address, 'Accounting Education for the 21st Century', 28 April; **CoAvi**, p. 13

National University of Singapore, staff seminar, 'CoCoA Developments', 2 May

National University of Singapore Students Accountancy Society, 'Accounting in a Rapidly Changing Environment', 3 May

ASA, Singapore Branch, luncheon address, 'Accounting Information and Securities Markets', 5 May

National University of Singapore, staff seminar, 'Groundwork for Accounting Standards', 6 May

Singapore Society of Accountants, luncheon address, 7 May

University of Singapore Students Society, address, May

Petersham College of Technical and Further Education, annual presentation of awards, address, 27 May

Institute of Affiliate Accountants State Conference, Sydney, 'Contemporary Accounting Issues', 18 October

1987 University of Sydney, honours class, 'Measurement', 'The Development of CoCoA', 'Objections to CoCoA', 6–9 July

Waseda University, Tokyo, general seminar; faculty and student address, 'The Functional Utility of Resale Price Accounting', 2 October; **CoAvi**, p. 489

Waseda University, faculty and graduate student seminar, 'Accounting as Financial Instrumentation', 3 October; **CoAvi**, p. 23

Sixth International Conference on Accounting Education and Research, Kyoto, 7–10 October; plenary session, panel member, 'International Exchange of Accounting Education and Research—Past, Present and Future', *Proceedings*

Hokkaigakuen University, Sapporo, 'Mathematical and Empirical Laws in Accounting', 12 October

1988 Fifth World Congress of Accounting Historians, Sydney, 22–24 August, 'Time in Accounting'; **CoAvi**, p. 51

Victoria University of Wellington, staff and student seminars, 'Financial Information and Decision Making—Recent Surveys'; 'Mathematical and Empirical Laws in Accounting'; intermediate student seminar, 'Liabilities', September; honours seminar, 'A Critique of Positive Accounting Theory', 3–17 September

University of Newcastle, senior student seminars, 'The Positive/Normative Debate'; 'Defence of CoCoA'; 10, 17 October

1989 Deakin University, Gordon Fellowship, twelve lectures, to Deakin and other Victorian faculty, on the logical and empirical foundations of accounting: 'The Commonsense of Technology and Science'; 'Financial Affairs and Their Control'; 'Communication; Observation, Measurement and Calculation'; 'The Anatomy of Choice'; 'The Development of CoCoA'; 'Enquiry; Modes of Enquiry'; 'Theories and Frameworks'; 'Standards and Standard-Setting'; 'The Positive and the Normative'; 'Enquiry and Education'; August–October

La Trobe University, Accounting and Economics staff seminar, 4 September; lecture to senior and honours students, 'Accounting Theory and Financial Measurement Models', 5 September

Deakin University, senior students, 'A True and Fair View', 19 September

ASA, Geelong Branch, 'Stock Market Pollution—by Law', 21 September

Deakin University, staff and students, 'The Background of *Financial Management*', 10 October

Warrnambool Institute of Advanced Education, lecture to senior students and staff, 'CoCoA', 12 October

ASA, Western Districts Branch, Warrnambool, business breakfast address, 13 October

Deakin University, School of Management research seminar, 'A True and Fair View of Results and Position: The Historical Background', 20 October; **CoAvi**, p. 69

Royal Melbourne Institute of Technology, lecture, 'Standards and Standard Setting', 23 October

University of Sydney, senior student seminar, 'Development of CoCoA', 1 November

1990 European Accounting Association Annual Congress, Budapest, 18–20 April, with P. W. Wolnizer, 'A True and Fair View of Position and Results: The Historical Background'; **CoAvi**, p. 85

University of Newcastle, 'Novocastrian Graduation', occasional address on admission to the degree of Doctor of Science *honoris causa*; presiding, the Chancellor, The Honourable Justice Elizabeth Evatt, AO; 11 May; **CoAvi**, p. 102

Australian National University, staff seminar, student lecture, 'Theories and Frameworks'; faculty and senior student seminar, 'Modes of Inquiry'; faculty seminar, 'Positive Accounting Theory and the PA Cult'; 15–17 May

Victoria University of Technology, RMIT Campus, mid-year conference, 'Research in Financial Accounting', 20 July

University of New South Wales, School of Accounting research seminar, 'Positive Accounting Theory and the PA Cult', 24 August

Monash University, Caulfield Campus, School of Accounting seminar, 'Future Directions of Accounting Research', 30 August

University of Sydney, Graduate School of Management, 'Allocation in Accounting', 8 October

Deakin University School of Management Research seminar, 'A True and Fair View of Position and Results: The Historical Background', joint author with P. W. Wolnizer, 20 October

University of Newcastle, senior student seminar, 'A Comparative Evaluation of Alternative Accounting Systems', 22 October

1991 University of Sydney Graduate School of Management and Public Policy, Summer School Course: 'Accounting and Financial Management', twelve lectures, January–February

Macquarie University, departmental seminar, 'Positive Accounting Theory and the PA Cult', 16 April

Deakin University, honours student seminar, 'Foundations of Accounting—Rules and Reasons', 20 April

University of Wollongong, senior student seminar, 'Origins and Development of CoCoA', 23 April

University of Sydney Pacioli Society, 'Accounting and Corporate Morality—the Ethical Cringe', 1 May; **CoAvi**, p. 131

University of Newcastle, address, 'The Ethical Foundations of Accounting', 5 June

University of Sydney Accounting and Finance Foundation Dinner, on announcement of following OSU and AAA awards; response: 'Carpe Diem!', 27 July; **CoAvi**, p. 144

Ohio State University Accounting Hall of Fame Induction; response—'Let Us Now Praise Famous Men . . .', Nashville, Tennessee, 13 August; **CoAvi**, p. 147

American Accounting Association annual conference, response to Outstanding Educator Award, Nashville, 13 August

Newcastle Town and Gown, 'An Educational Scandal', 13 November; **CoAvi**, p. 149

1992 Sydney Probus Club, 'Life on the Fringe [of academic, professional and business affairs]', 3 March

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Monash University, Faculty and other Victorian academics, 'Historical Cost—Tale of a False Creed', 14 September

University of Western Sydney, Campbelltown, guest lecturer, 'Historical Cost—Tale of a False Creed', 20 September

University of Western Sydney, Hawkesbury, 'Dilemmas of Conventional Accounting', 28 October

1994 Monash University, research seminar, 'The Factual, the Financial and the Fictional in Accounting', 3 May

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1995 Monash University, staff seminar, 'The Case for Simplicity in Accounting', 28 March, **CoAvi**, p. 240

1996 Deakin University, Burwood Campus, BCom students, guest lecture, 'Alternative Accounting Systems', 15 May

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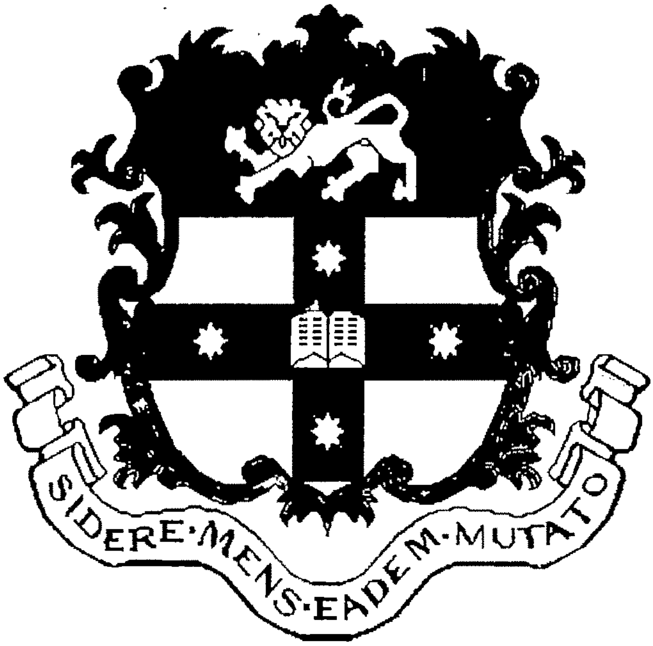

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ABACUS, Vol. 37, No. 3, 2001

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EDITORIAL

In a new millennium, nearly four decades after the founding editor of *Abacus*, R. J. Chambers, wrote 'Financial Information and the Securities Market' (1965), Australia is experiencing a corporate *déjà vu*, with accounting and auditing practices being criticized again as large unexpected collapses occur—namely, the financial imbroglios associated with the second-largest insurance company in Australia, HIH, the major men's retailer Harris Scarfe and the international telco, One-Tel. The contents of Chambers' article were novel and controversial, but these were to be common attributes of *Abacus* articles over time. That article inquired systematically into the role of accounting, which had attracted substantial complaint and criticism flowing from inquiries into large, unexpected corporate collapses: Australian *causes célèbres*, Reid Murray, H. G. Palmer and Stanhill. Clarke *et al.* (1997) provide detailed accounts of those 1960s collapses, together with accounts of similar collapses in the 1970s and 1980s.

It would seem that Chambers' seminal work was only an instalment, and the issues he addressed were systemic rather than aberrations. Consider his concluding remarks:

> We do not pretend that the best results of any such inquiry will do away with company losses through lack of technical adaptation or mistakes of judgment. But we do believe that an adequate system of financial publicity, reflecting the realities of changing market conditions, would reveal the consequences of such mistakes much earlier than the present system, and would thus materially reduce the severity of losses. But we are more concerned with efficiency than with avoiding losses. As companies and their operations affect, in one way or another, the lives of us all, as they have such an extensive impact on incomes, employment, the development of industry and the distribution of economic power; there can be no doubt about the social value of efficient corporate business. And as every member of the community is a potential investor who may base his income expectations and capital protection decisions on published financial statements, there can be no denying that an efficient means of financial communication, enabling investors to judge in an informed way the efficiency of corporate business, is a critical necessity. Improvement in the quality of published financial information is commended as one suggestion for removing the ignorance and many of the uncertainties which now bedevil the securities markets, for

changing the character of the securities markets from that of a casino with loaded dice to that of an instrument of rational and informed economic development.

Abacus continues to seek original research articles that will address, *inter alia*, the types of problems alluded to above. This policy has resulted recently in *Abacus* receiving the Emerald (previously Anbar) Golden Page Award for Best Research Implications for its three issues in 2000. This award placed *Abacus* ahead of fifty-three international accounting and finance journals. The June 2001 issue had already noted that 'After thirty-seven years *Abacus* continues to receive international accolades for publishing papers of "most original content" . . . In 1999 and 2000 *Abacus* received the Anbar Golden Page Award for Originality for its 1997 and 1998 issues.'

The editorial in the next issue will provide details demonstrating that *Abacus* continues to publish articles canvassing myriad subject matter and using eclectic research methods. The journal's prospects are most favourable. Submissions continue to be received from academics and practitioners in many countries, with most issues having around half the articles written by non-Australasian authors—a recent issue had 100 per cent. The acceptance rates at approximately 20–25 per cent of the submissions are indicative of both their number and quality. Subscription levels remain healthy, in spite of continued pressure from library subscription drop-offs worldwide. Further, *Abacus* continues to be distributed in over forty countries with around 800 overseas subscribers (as well as approximately 200 in Australasia). Those subscription levels are augmented by strong electronic e-journal delivery and concomitant e-journal access rates in 2000 and 2001.

I am confident that the *Abacus* readership is looking to the next four decades for more eclectic research addressing significant commercial problems.

Graeme Dean
University of Sydney
June 2001

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ABACUS, Vol. 37, No. 3, 2001

PHILIP BROWN AND ANN TARCA

Politics, Processes and the Future of Australian Accounting Standards

The perspective of public interest and interest group theories of regulation is adopted to consider the future of Australian accounting standards following major reforms proposed by the Australian Commonwealth government as part of its 1997 Corporate Law Economic Reform Program (CLERP). Interest groups in the Australian environment are identified. Their lobbying had influenced the initial proposals; and their reactions when the CLERP proposals were published resulted in substantial modifications to the CLERP proposals, which had initially recommended that International Accounting Standards (IASs) be adopted as national standards from 1 January 1999.

The role of accounting standards and the structure of standard setting are explored. The political nature of standard setting is illustrated through a review of the CLERP proposals, submissions of various interest groups and the government's responses to them. The central arguments are that key assumptions underlying the CLERP proposals are flawed, and that the CLERP proposals could not achieve the outcomes desired of them.

It seems inevitable, however, that international standards eventually will supplant domestic standards. In the longer term, Australian standard setters seem destined to have a diminished role in the international standard setting arena.

Key words: Accounting regulation; CLERP; International accounting standards; Lobbying; Standard setting.

Government regulation of business, a feature of corporate life, has varied in scope and effect over time and across countries. How we are regulated, and by how much, are influenced by political forces, as institutional authorities respond to demands from vested interest groups. In 1997, political activity saw the Liberal/National Party coalition government, led by John Howard, introduce its Corporate Law Economic

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Philip Brown is Professor and Ann Tarca is Lecturer in the Department of Accounting and Finance, the University of Western Australia.

We sincerely thank the people interviewed during the preparation of this article for their generous assistance (see Appendix B). Many others have assisted us with their comments: conference participants at the Second International Conference on Globalization and at the AAANZ conference in 1999; seminar participants at the University of Sydney, University of Tasmania, Australian National University and University of Western Australia; and especially Russell Craig, Graeme Dean, Scott Holmes, Bryan Howieson and Keith Reilly. Philip Brown thanks CPA Australia and the University of Tasmania for the opportunity to present some of this material at the University of Tasmania Research Lectures in 1998; and likewise CPA Australia and the University of Melbourne for a similar opportunity in the form of the 61st Annual Research Lecture at the University of Melbourne. He also thanks the Australian Research Council for financial assistance.

Reform Program (CLERP) early in the life of that government.[1] The first paper in a whole series of reforms, CLERP #1, proposed substantial changes to the way Australian accounting standards are set. Had the proposals come to fruition, Australia would have been the first economically developed nation with a strong standard setting tradition to commit to the adoption of International Accounting Standards (IASs)[2] as a matter of course, with potentially profound consequences that were not widely understood at the time.

This article discusses the CLERP #1 proposals and their origins, considers reactions to the proposals by parties interested in standard setting, summarizes the legislative response to those reactions, and draws implications for the future of the standard setting process in Australia.

GOVERNMENT REGULATION AND ACCOUNTING STANDARD SETTING

Government regulation of commerce can be traced at least as far back as the Industrial Revolution in England. A more recent feature has been a shift towards the deregulation of financial services and the privatisation of government business enterprises. Yet regulation of financial reporting has increased, especially over the last thirty years, with standard setters pursuing a busy work schedule and new standard setting groups emerging. Given these apparently contradictory trends, the role of accounting standards, and why governments are becoming increasingly involved in their determination, merits consideration.

Accounting standards exist because they are a relatively efficient solution to a serious agency problem. The problem arises from the separation of ownership and control of a firm. A principal—the firm's owner, but more particularly a supplier of risk capital—appoints an agent to act on the principal's behalf, but the agent has incentives to act in their own self-interest, which may differ from the principal's. The agent is the firm's manager, who typically is remunerated, whether directly or indirectly, according to the firm's ability to generate value. Being an insider, the agent has more knowledge of the firm than the outsiders—that is to say, the shareholders and debt holders. To raise capital on more favourable terms, the manager is motivated to disclose otherwise private information to the outsiders.

In theory it would be possible for every manager to contract privately to have their performance monitored and to provide, periodically, every financier with an individually tailored and independently audited financial report. However, active trading in primary and secondary capital markets would mean that the number of separate contracts would rapidly become very large indeed. Thus, in countries where capital markets are an important source of finance, uniform accounting and auditing standards have evolved as a relatively low cost solution to a potentially expensive agency problem. That partially explains why we have accounting standards but it does not explain why governments become involved.

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[1] Abbreviations are listed in Appendix A.

[2] The standards produced by the International Accounting Standards Committee (IASC) were favoured over other alternatives (see below). From 2001, the IASC became the International Accounting Standards Board (IASB) and the IASs were renamed International Financial Reporting Standards (IFRSs) (Lymer, 2001a). The terms IASC and IASs are used in this article as they were current during the period under discussion.

The involvement of government in setting accounting standards results from a form of market failure. Market forces alone do not generate the quality or quantity of information required for the greatest benefit to society. Economist George Stigler's (1971) 'public interest' explanation for government's regulation of the market for information is that it does so in response to demands from community interest groups, to achieve socially desirable outcomes. Events that support this view include the establishment of regulators after significant market collapses. Examples are the formation of the U.S. Securities and Exchange Commission (SEC) following the U.S. stock market crash of 1929 and subsequent revelation of financial abuses (De Bedts, 1964), and the creation of the Accounting Standards Review Board (ASRB) by the Australian Commonwealth government in 1984. Posner (1974) described interest group and related capture theories of regulation, suggesting regulators respond to the demands of special interest groups. They lobby the relevant regulatory authority to achieve an outcome favourable to them, and the regulator responds positively to the group with the most political clout.[3]

The influence of special interest groups in the accounting standard setting process has been evident for many years. For example, Solomons (1983) described situations in the U.K. where industry groups obtained exemptions from requirements of accounting standards to which they objected. Similarly, strong opposition in the U.S.A. to the Financial Accounting Standards Board's (FASB) proposal on accounting for employee stock options saw lobbying that was extensive, unprecedented and ultimately successful (Mozes, 1998). Walker and Robinson (1994) considered the determination of Australian disclosure rules for related party transactions, concluding that 'the pattern of interactions between government and the profession was consistent with the efforts of individual organizations to manage, defend or maintain the "domains"' (p. 19). More recently, interest groups—notably companies in the finance sector—lobbied successfully in relation to Australia's ED 59, *Financial Instruments.* The resulting standard, AASB 1033, *Presentation and Disclosure of Financial Instruments,* dealt only with disclosure. Interest groups are not always successful in their lobbying, as shown by the Australian standard AASB 1023, *Financial Reporting of General Insurance Activities.* Although the exposure draft was opposed vigorously by companies from the insurance sector—because of its mark-to-market requirement—the standard (and that requirement) was adopted.

Figure 1 shows various influential interest groups in the Australian regulatory environment. It highlights the complexity of the relationships among the groups. Furthermore, some groups take on multiple roles. For example, ASIC is both a

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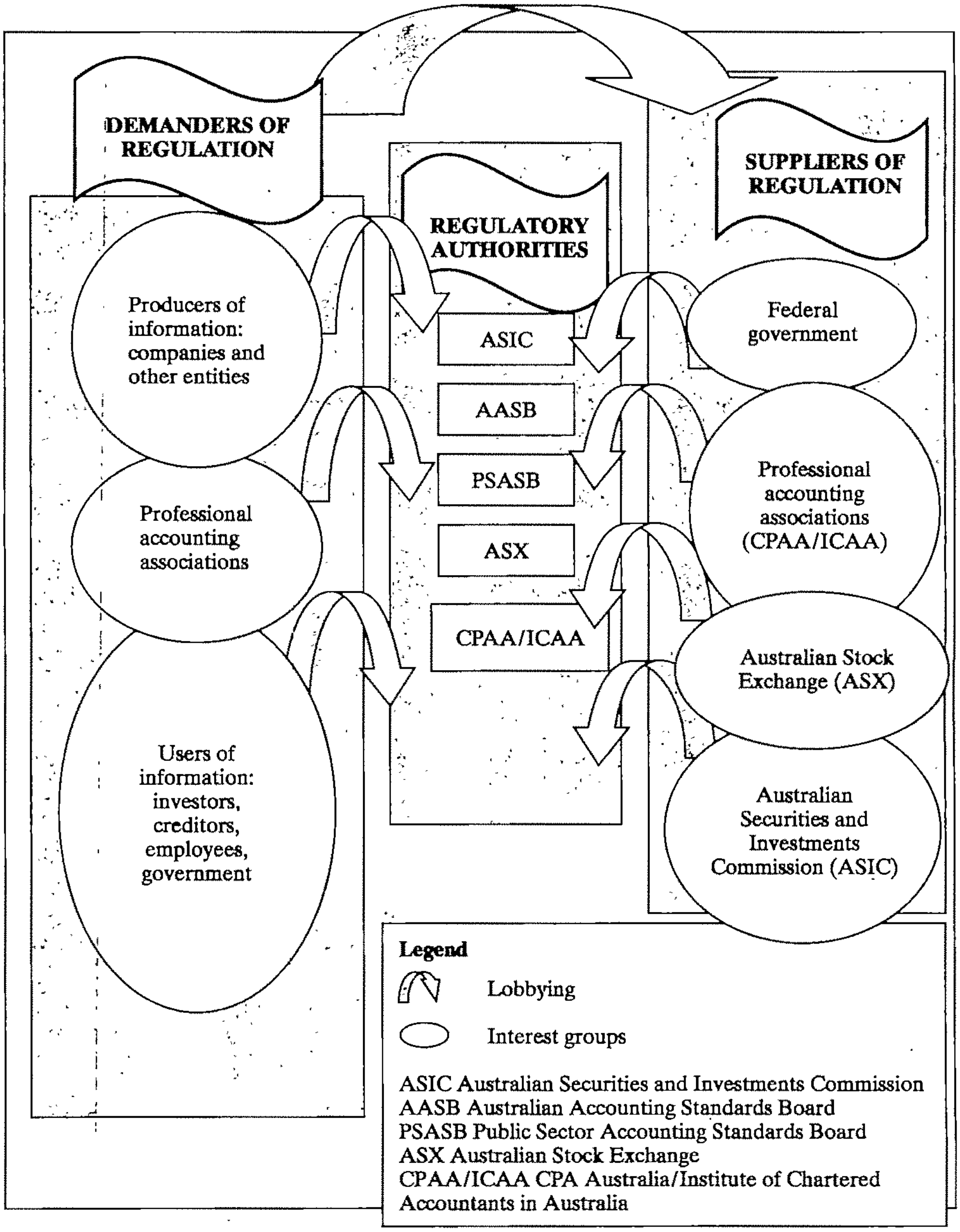
[3] According to 'capture' theory, a situation can arise where an interest group comes to control the regulator. This was explored by Walker (1987), who suggested that regulatory capture occurred in Australia when the accounting profession achieved domination of the ASRB. Rahman (1992) concluded that, in the 1980s, the politically influential corporate management group won control of the Australian standard setting process.

FIGURE 1


DEMANDERS OF REGULATION
Producers of information: companies and other entities
Professional accounting associations
Users of information: investors, creditors, employees, government
REGULATORY AUTHORITIES
ASIC
AASB
PSASB
ASX
CPAA/ICAA
SUPPLIERS OF REGULATION
Federal government
Professional accounting associations (CPAA/ICAA)
Australian Stock Exchange (ASX)
Australian Securities and Investments Commission (ASIC)
Legend
Lobbying
Interest groups
ASIC Australian Securities and Investments Commission
AASB Australian Accounting Standards Board
PSASB Public Sector Accounting Standards Board
ASX Australian Stock Exchange
CPAA/ICAA CPA Australia/Institute of Chartered Accountants in Australia

regulator and a supplier of regulation. The two major accounting bodies (CPA Australia and ICAA) assume both these roles as well as that of a demander of regulation.[4] The stock exchange (ASX) is both regulator and listed company subject to a regulator (ASIC), giving rise to a potential conflict of interest that has been noted by other interest groups (ASCPA and ICAA, 1998). Moreover, roles change over time. Professional accounting bodies were originally responsible for issuing Australian accounting standards, a function that was transferred to the Accounting Standards Review Board (ASRB, now the Australian Accounting Standards Board, or AASB) following government intervention. The professional accounting associations have continued their close involvement by funding the Australian Accounting Research Foundation (AARF), a body that provided technical and secretarial support to the AASB and, apart from the Commonwealth government, by making the largest contribution to the costs of the Australian Accounting Standards Board (AASB, 2000).[5]

To summarize, accounting standards address an important agency problem. Since contracts for the supply of capital or managerial expertise, say, are written within a particular standards environment, any new or changed accounting standard carries the potential for wealth transfers from some people to others. Thus, the setting of standards becomes, inevitably, a political process. Potential winners and losers in the wealth stakes have an incentive to lobby the legitimating authority, be it the standard setter or ultimately the government of the day, to influence the outcome of the standard setting process.[6]

The framework for managing the involvement of governments and other interest groups in standard setting in several countries has been converging, as is illustrated by comparing present day arrangements in four developed market economies (see Table 1). The U.S.A., U.K., Australia and New Zealand all feature standard setting boards. In the U.S.A. and U.K. an oversight committee is used to direct the process and ensure the board's independence. In some countries, liaison groups are used to promote consultation with interest groups and separate committees deal with urgent issues. Each of the four countries has a body responsible for regulating or monitoring financial reporting. Along with Canada and the International Accounting Standards Committee (IASC) as observer, they were also members of G4+1. This group met to share knowledge and resources, in response to the growing demand for international solutions to accounting issues.[7]

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[4] The National Institute of Accountants (NIA) is the third Australian professional accounting body.

[5] Operating revenues of the AASB for the six months to 30 June 2000 included $648,000 from government, $162,500 each from CPA Australia and the ICAA, and $20,000 from the ASX (AASB, 2000, Note 5). The Financial Reporting Council, which oversees the AASB, had also 'received total offers or commitments from stakeholders to provide funding of $2.88 million in 2000–01 and $2.81 million in 2001–02' (AASB, 2000, p. 2).

[6] The inevitably political nature of standard setting has of course been recognized for many years (Gerboth, 1973; Horngren, 1973; Solomons, 1987; Zeff, 1978).

[7] In February 2001 the G4 + 1 disbanded because the new structure of the IASC has given the national standard setters the role they wanted in the development of global standards (Lymer, 2001b).

Table 1

COMPARATIVE STRUCTURES FOR STANDARD SETTING AND ENFORCEMENT

	U.S.	U.K.	N.Z.	Australia
Standard setting board	Financial Accounting Standards Board (FASB) Seven independent members, appointed for a maximum of two five-year terms. Meetings open to the public.	Accounting Standards Board (ASB) Seven part-time members, full-time paid chairman and technical director.	Accounting Standards Review Board (ASRB) A government funded body with four to seven members appointed by government.	Australian Accounting Standards Board Eleven members appointed by government from nominations of interested groups.
Date formed	March 1973 (replaced Accounting Principles Board). Standard setting no longer the responsibility of the AICPA.[a]	August 1990 (replaced Accounting Standards Committee, overseen by the professional accounting bodies).	1993	1991 (replaced the Accounting Standards Review Board).
Purpose	'To establish and improve standards of financial accounting and reporting for the guidance and education of the public' (Scott, 1997, p. 358).	To develop and publish accounting standards.	To provide policy guidance on financial reporting; to review and approve standards presented by the FRSB.	To develop a conceptual framework; to develop and review accounting standards; to undertake public consultation on standards.
Observers				Representatives of government, IASC and NZ's FRSB.
Oversight committee	Financial Accounting Foundation (FAF) Created to ensure an independent standard setting board. It appoints FASB members and raises funds for its operation. There are sixteen trustees from organizations representing managers, academics, management accountants, investment bankers, financial analysts, government accounting groups and professional accountants.	Financial Reporting Council (FRC) The committee oversees the standard setting process to ensure various parties have their interests considered. Representatives are from industry, commerce and the accounting profession. Members (25) are unpaid volunteers.	No oversight committee.	No oversight committee.

Research support	No separate organization.	No separate organization.	Financial Reporting Standards Board (FRSB) The board is the standard setting organization of the N.Z. Society of Accountants. It submits standards to the ASRB.	Australian Accounting Research Foundation (AARF) Funded by professional accounting bodies, AARF provides technical support to AASB and PSASB. AARF cannot issue or amend standards.
Liaison group	Financial Accounting Standards Advisory Council (FASAC) Over forty members, with diversified interests, appointed by FAF. Liaises between FASB and business community. Advises on priorities and potential projects and the suitability of FASB's preliminary position.	No liaison group.	No liaison group.	AASB Consultative Group Comprises twenty-four members representing finance, banking, insurance, funds management, the securities industry, the stock exchange, shareholders' associations, large and small business, the law, academia, the accounting profession and ASIC. The group has input on AASB work priorities. PSASB also has a consultative group.
Urgent issues	Emerging Issues Task Force (EITF) Thirteen members from accounting firms, and associations of those preparing accounts. Provides a consensus opinion on specific accounting problems.	Urgent Issues Task Force (UITF) A committee of the ASB with fifteen members that deals with issues not satisfactorily covered by existing standards.		Urgent Issues Group (UIG) Formed in 1985 to provide a quick response to accounting problems that emerge. Sixteen members and ASIC observer. AASB and PSASB can veto any decision made.
Public sector standards	Government Accounting Standards Board (GASB) Produces standards and interpretations for all levels of government.	No separate board, but advice from Public Sector Liaison Committee to ASB on issues relevant to the public sector.	No separate public sector standard setting board. Standards are formulated to apply to both public and private sector organizations.	Public Sector Accounting Standards Board (PSASB) is a board of the AARF which produces standards for all levels of government that are compatible with AASB standards.

Table 1 (Continued)

	U.S.	U.K.	N.Z.	Australia
Regulator	Securities and Exchange Commission (SEC) Public sector body with five members and authority delegated by government to control the stock market. It is empowered to determine disclosure and reporting requirements but standard setting is delegated to FASB. Intervention occurs through issue of Accounting Series Release (ASR) directives.	Financial Reporting Review Panel (FRRP) A committee of the FRC that has power delegated from the government to challenge accounts that do not comply with accounting standards. It does not monitor accounts itself but acts on complaints from interested parties and has the power to take legal action against companies.	Registrar of Companies monitors compliance with the statutes and regulations relating to companies. Securities Commission monitors compliance with corporate law by public issuers of securities.	Australian Investments and Securities Commission (ASIC) A statutory corporate body with three to eight members appointed by government. ASIC can intervene in standard setting by the issue of accounting policy releases and practice notes.
Aim	'ensure that investors are supplied with adequate information' (Scott, 1997, p. 360).	To ensure that financial reporting presents a true and fair view.	The Securities Commission aims to facilitate private capital investment.	'to ensure the confidence of investors by ensuring adequate protection for investors' (Belkaoui and Jones, 1997, p. 90).
Law	Dealing in securities and investor protection regulated by Securities Act 1933 and Securities Exchange Act 1934.	Company regulation from Companies Act 1989.	Regulation from Companies Act 1993 and Financial Reporting Act 1993.	Australian Securities Commission Act 1989 outlines functions of the AASB. Corporations Law provides companies legislation.
Application	SEC regulations apply to listed companies. SEC may reject financial statements that do not comply with FASB standards.	Company law applies to all limited liability companies. There are legal sanctions for non-compliance with standards, although a true and fair override exists.	Accounting standards are mandatory for all companies (except those exempt) and all public issuers of securities.	Accounting standards have the force of law for companies. ASIC can take legal action for non-compliance.

[a] American Institute of Certified Public Accountants

Sources: Belkaoui and Jones (1996), Baydoun *et al.* (1997), Lawrence (1997), Radebaugh and Gray (1997), Scott (1997), Nobes and Parker (1998).

FORCES FOR CHANGE

Forces for change are grouped into two categories: those abroad; and those at home.

Abroad

The development of global business has led to demands for greater international comparability in financial reporting. It has been argued that improved comparability would benefit both producers and users of financial information. Producers would achieve cost savings by avoiding the restatement by translation of accounting information, and there would be more efficient decision making by capital providers. Financial markets would become more liquid and competitive, resulting in less information risk and a lower cost of capital for firms (Saudagaran and Meek, 1997). The European Union (EU) and the IASC have been involved in the quest for international harmonization in reporting (that is, greater comparability) as both have produced standards or regulations for use across national boundaries. Their present standard setting structures are outlined in Table 2.

The EU commenced a program to harmonize company law in the 1960s. It issued regulations and directives, but consensus among the member states has been difficult to reach (Roberts *et al.*, 1996). The EU harmonization effort succeeded in raising the level of information disclosure, but until recently it did little to remove differences in accounting measurement practices. In July 2000 the EU announced proposals requiring all European listed companies to use accounting standards promulgated by the IASC for consolidated financial statements by 2005 (IASC, 2000a).

The IASC has produced a comprehensive set of accounting standards for use by all types of entity, irrespective of their country of origin, size or business activity. Although the IASC's accounting standards (IASs) have been widely used in the development of national standards (Pacter, 1998; IASC, 2001), few countries have undertaken 'wholesale adoption' (eight were identified by Collett *et al.*, 1998). However, IASs are accepted for use by foreign-domiciled companies on several national stock exchanges, including London, Frankfurt, Singapore and Australia (IASC, 2001).

Debate about the quality of IASs led the IASC to undertake its comparability project.[8] Subsequently a core set of thirty standards was submitted to the International Organization of Securities Commissions (IOSCO) for endorsement. In May 2000 IOSCO recommended that its members allow foreign-domiciled issuers listed on a member country's stock exchange to adopt the IASC core standards for financial reporting purposes. IOSCO did provide an escape clause, however, in that member countries remain free to require supplementary reconciliation or disclosure to address outstanding national or regional issues (IOSCO, 2000). Thus the U.S. regulators, for example, can still require foreign-domiciled companies that raise capital in U.S. financial markets to reconcile their net income and stockholders' equity to their values under U.S. GAAP, without going against the IOSCO position.

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[8] *Comparability of Financial Statements E32* was issued by the IASC in December 1998.

TABLE 2

COMPARATIVE STANDARD SETTING STRUCTURES: REGIONAL AND INTERNATIONAL STANDARD SETTING

	IASC (Pre-2001)	European Union
Members	A private sector body whose members are 140 professional accounting associations from 101 countries (as at 1998).	A government organization representing Belgium, France, Germany, Italy, Luxembourg, Netherlands, Denmark, Ireland, U.K., Greece, Portugal, Spain, Austria, Finland and Sweden.
Date formed	1973	Formed from the European community on January 1, 1994.
Purpose	'To formulate and publish accounting standards for use in the presentation of financial statements and to promote their worldwide acceptance; to work for the improvement and harmonisation of accounting standards and procedures relating to the presentation of financial statements' (Iqbal *et al.*, 1997, p. 36).	The unification of economic and industrial policies by creating a uniform economic environment in the EU. This includes the harmonization of fiscal, monetary, tax and corporate laws and accounting standards (Iqbal *et al.*, 1997, p. 44).
Standard setter	IASC Board members are appointed by International Federation of Accountants (IFAC). Meetings involve up to fifty people. Thirteen member countries have two representatives and a technical adviser.	EU Commission uses a working party to draft directives and regulations that are commented on by the European Parliament and the Economic and Social Committee before the Council of Ministers decides about adoption.
Associated organizations	IASC Advisory Council promotes the acceptability of IASC standards. IASC Consultative Group comprises international groups representing business, finance, trade unions, securities commissions, banking and the law. The World Bank, FASB and EU are members and the OECD and UN are observers.[a] Standards Interpretation Committee (SIC) to clarify the interpretation of standards.	Accounting Advisory Forum comprising preparers and users of financial information advises the EU Commission. The forum is to encourage consultation between professional and government standard setting agencies and other interested parties. Federation des Experts-Comptable Europeens (FEE) assists in drafting the directives.
Funding	Member organizations including IFAC, multinational corporations.	Member nations.
Standards	IASs 1–40	EU directives (first–thirteenth) and regulations.
Application	All business environments regardless of type or business activity.	As stated in directives and regulations.
Jurisdiction	Standards cannot be enforced by the IASC.	Member nations must incorporate the directives into their law and regulations. Regulations are applicable to all members without the need for national legislation.

Sources: Iqbal *et al.* (1997), Lawrence (1997), Nobes and Parker (1998).

[a] Organization for Economic Cooperation and Development; United Nations Transnational Corporations and Management Division.

TABLE 3

INTEREST GROUPS RESPONDING TO CLERP

Interest group	Number of repondents (Total = 48)
Producers of financial information	
Companies	6
Producers representative associations	6
Users of financial information	
Professional accounting firms	5
Academia and individuals	10
Public sector organizations	13
Regulators	8

In May 2000 a new structure was created for the IASC, in a major push to project it as the pre-eminent global standard setter. The new structure is designed to address issues of governance, due process, implementation, enforcement and funding (IASC 2000b). The IASC is now an independent organization with trustees and a board. National standard setters will participate in the process through their membership of the Standards Development Committee and liaison with the Standards Development Advisory Committee. Importantly, the new structure reflects the thinking of the U.S. authorities and signals a desire for greater U.S. involvement in the IASC. Although structure is important, the 'new IASC's' effectiveness also will depend critically on the political and technical skills of its people.

At Home

All of the interest groups identified earlier were involved in the consultative process that led to CLERP #1. Many wanted changes in Australian standard setting, albeit for different reasons, and several played key roles in promoting change and influencing its form.[9]

The ASX had an international view of its operations. Its CEO, Richard Humphry, was arguing forcibly that international standards would benefit companies and capital markets (Humphry, 1997). ASX saw the use of IASs as a way to protect and expand its business. ASX support for IASs reflected the influence of people committed to IASs, including Humphry, other ASX staff and especially ASX board member and then IASC Chairman, Michael Sharpe. Although not acknowledged by representatives of Treasury or government, other interviewees[10] commented to us that the ASX's views were very effectively communicated to government by Humphry, Sharpe, and ASX Chairman Maurice Newman. There can be no doubt that the ASX was a central party in determining the content of CLERP #1.

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[9] Stoddart (2000) examined the behaviour of stakeholder groups during this period within the context of corporatism and inter-organizational domain conflict models of regulatory processes.

[10] Appendix B identifies the people interviewed during the preparation of this article.

In the period before CLERP #1, the ICAA was a strong supporter of international harmonization and IASs.[11] The ICAA position apparently was influenced by the views of its then president, Jeff Lucy, and its technical director, Keith Reilly, by the views of the corporate sector, and through its links with Michael Sharpe (IASC chairman, 1995–7 and a past president of the ICAA). The ICAA was also sensitive to the burden of its funding commitment to standard setting. Defraying the costs by sharing them with other countries and adopting international standards must have been an attractive option. By contrast, CPA Australia was more cautious in its response to globalization initiatives, arguably reflecting the views of the organization's leaders including 1995 President Jim Kropp and technical director Colin Parker.

The Group of 100 (G100), a body comprising the chief financial officers of Australia's largest corporations and speaking for the Business Council of Australia (BCA) on financial reporting matters, was a strong supporter of international harmonization. A Treasury spokesperson suggested that some of the largest corporations were frustrated with Australian standard setting and felt their views were being ignored. Large companies considered that they were players in a global field and that convergence of accounting standards made economic sense. These views were communicated effectively by business leaders to the government directly, and through G100[12] and companies' links with the professional accounting bodies such as the ICAA. Interviewees commented that some members of the corporate community had a clear understanding of the implications of supporting IAS standards, either through adoption or harmonization. They realized there would be both costs and benefits but were still prepared to adopt international solutions. In contrast, comments were also made that other company representatives were less concerned about the cost and benefit complexities and simply saw IASs as a more flexible, therefore preferable, regime. Irrespective of their viewpoints, the result was that the corporate community encouraged the government, Treasury and the ICAA to pursue global standards.

The AASB and AARF also supported proposals for change. They wanted a standard setting structure that followed the U.S. or U.K. model with an independent board, adequate funding and an integrated research unit. They sought greater participation by stakeholders in standard setting and believed this could be achieved through appointment of an oversight body. The AASB and AARF, together with the ICAA and CPA Australia, approached the government to obtain a new structure for standard setting that achieved their objectives and involved a secure and broader funding base.

A restructuring in 1996 made the Department of Treasury responsible for corporate regulation. Officers of Treasury responsible for drafting CLERP #1 responded to directions from Treasurer Peter Costello and the Minister Assisting the Treasurer,

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[11] See, for example, ASX (1995).

[12] A spokesperson for G100 did not regard their group as particularly persuasive; however, other interviewees commented that the government was influenced by the Group of 100 and members of the corporate community.

Senator Ian Campbell, and seemingly to opinions expressed to them by members of the corporate community. Treasury shared the corporate view that the existing system for standard setting was dominated by accountants and that the consultative process was not effective in representing the views of business. It appears that Treasury was responsible for the CLERP #1 proposal that Australian representatives promote market value accounting among international standard setters, and that Senator Campbell fixed 1 January 1999 as the starting date for adopting IASs.

The ASC (now ASIC) did not take an active role in the change process. ASIC's relatively benign role in the politics of the standard setting process, as opposed to its compliance monitoring role, contrasts sharply with the higher profile of the SEC when similar issues have been debated in the U.S.A. over nearly seventy years (see Chatov, 1975; Zeff, 1973). Because the SEC has delegated power to FASB to set standards, we would expect the SEC would be involved in any changes suggested for FASB. By contrast, in Australia, the AASB reported directly to the responsible minister, thereby bypassing the ASIC.

The Liberal Party and National Party coalition, voted into government in May 1996, heard what appeared to be a common call—from the corporate community, the ASX, the professional accounting bodies and the AASB—for changes to the current standard setting structure. The relevant government ministers arguably felt that constituents wanted a substantive change to the present structure and that there was widespread support for international convergence in accounting standards. The Corporate Law Economic Reform Program was formally launched in March 1997. Senator Ian Campbell was involved in wide consultation with community interest groups during the development of CLERP #1, 'Accounting Standards: Building Opportunities for Australian Business', which was released that September.

CLERP #1: CONCERNS, OUTCOMES SOUGHT AND THE PROPOSALS

CLERP #1 listed concerns that had been raised about Australian accounting standards and the standard setting process. These included the following (CLERP #1, 1997, pp. 11–12):

- the existing arrangements for accounting standard setting are confusing, inefficient and not conducive to stakeholder participation;
- there is duplication between the AASB and the Public Sector Accounting Standards Board (PSASB);
- Australian accounting standards are not understood in, and are out of step with, the major capital markets in the U.S.A., U.K. and Europe, thereby resulting in higher costs of capital for Australian business;
- the standard setting process is perceived to be dominated by the accounting profession and there is no real accountability to its users;
- accounting standards do not reflect modern business practices, being too prescriptive and overly technical, thereby imposing excessive costs on business; and
- the processes involved in standard setting have failed to attract broad input and the necessary level of financial support, with the result that accounting standards are not meeting the demands of constituents.

Three specific outcomes that the government was seeking to achieve in its reform of accounting standards were set out (CLERP #1, 1997, p. 12):

1. a clear and relevant policy framework for the development of accounting standards to ensure they are responsive to changes in commercial practices, meet the needs of users without being overly burdensome, and improve Australia's international competitiveness;
2. improved institutional arrangements for the standard setting process that will ensure that the process operates in a responsive, efficient and effective manner, thereby enabling all relevant stakeholders to participate while maintaining the independence of the process; and
3. a more equitable spreading of the cost burden in respect of the funding of the standard setting process so that those who benefit from accounting standards contribute to their development.

CLERP #1 contained various proposals to address the concerns and achieve the outcomes. Proposals covered:

1. the role of accounting standards;
2. a rebuttable presumption that Australian standards would soon be replaced by those issued by the IASC;
3. institutional arrangements, such as the setting up of the Financial Reporting Council (FRC) to oversee the AASB;
4. the renaming of the AASB as the AASC (this proposal subsequently was dropped);
5. secretariat and research support;
6. funding totalling $10 million over three years; and the widening of the funding base to reflect a 'user pays' policy;
7. legal backing for accounting standards (as was the case under s. 296 of the Corporations Law [Commonwealth]);
8. merging the AASB and the PSASB; and
9. various other issues, including a requirement for Australia's representatives to promote mark-to-market accounting internationally.

The most controversial initiative in CLERP #1 was the rebuttable presumption that Australia should discontinue issuing its own standards and instead move quickly to adopt international accounting standards issued by the IASC:

> From 1 January 1999, the AASC should issue identical exposure drafts of standards for public comment to those issued by the IASC with the objective that final standards issued by the AASC would be consistent with Australian law and be the same as those issued by the IASC, unless the Government, on advice from the FRC, determines that to do so would not be in Australia's best interests. (CLERP #1, 1997, p. 2)

Another proposal was the introduction of an oversight body, the FRC, to which the standard setter would be accountable. The FRC's membership was to reflect users of financial statements, preparers (of financial statements), governments and the public sector, the accounting profession, the ASX and the ASC. The breadth of the powers proposed for the FRC were the cause of some concern. Specifically, the FRC was to:

1. appoint the AASB's members (except the Chair, who was to be appointed by the Minister);
2. determine the AASB's broad strategic direction and approve and monitor the AASB's priorities, business plan, budget and staffing arrangements;
3. make recommendations about, and oversee, the AASB's consultative arrangements and give the AASB advice, directions and feedback on its general policies and procedures;
4. monitor the development of international accounting standards to further harmonisation and to promote a greater role for international standards if doing so would be in the best interests of investors, business and Australia's capital markets; and
5. monitor the operation of accounting standards to assess their continued relevance and effectiveness in facilitating Australian business. (CLERP #1, 1997, p. 3)

REACTIONS TO THE CLERP PROPOSALS

Interest group theory suggests that regulation is supplied by the parliament in response to demands by interest groups who have power over parliamentarians through the electoral process. The role of interest groups in 'demanding' legislation was discussed. Now their reaction to the proposals is outlined, illustrating that the process of influencing the 'regulator' (the Commonwealth government in the present case) does not necessarily produce the outcome desired by all parties.

International Standards

Reactions were invited to the CLERP proposals and thirty-two written submissions were made to Treasury. They almost unanimously opposed a move to 'wholesale adoption' of international standards from 1 January 1999. Although the government and Treasury had correctly perceived widespread support for international harmonization, for many parties involved this did not translate into support for 'wholesale adoption'. Interest groups were concerned about control of financial reporting, quality of IASs and the level of acceptance of IASs in major capital markets.

The G100 did not agree with the date proposed for the adoption of IASs or with issuing exposure drafts identical to those of the IASC. It said that this would 'limit the flexibility of the AASB to manage the process and adapt to changes in the environment as they occur' (G100, 1997, p. 5). These comments were repeated by the Australian Institute of Company Directors (AICD), which recommended that the timing and extent of mandatory adoption not be specified but be under the review of the FRC (AICD, 1997). The Australian Bankers' Association (ABA) supported the adoption of IASs subject to the elimination of accounting treatment options and to changes that may be required because of Australia-specific issues. The ABA stated that adoption should be deferred if there is fundamental disagreement with an IAS, and the standard setter not the government should decide whether a departure from an IAS is necessary (ABA, 1997). BHP (1997) and AMP (1997) did not support the adoption of IASs at 1 January 1999, noting there were problems with the level of acceptance of IASs in major capital markets. NAB (1997) suggested that Australia should develop its own standards to maintain control over financial reporting. ANZ (1997) argued that Australia should adopt IASs subject to the elimination of optional accounting treatments and to any changes that may be required because of specific Australian issues.

The ICAA and the ASCPA considered the adoption of IASs in lieu of domestic standards from 1 January 1999 was premature. They argued that any commitment to IASs depended on three criteria being met: adoption of IASs by major capital markets; an effective role for Australia with the IASC; and substantial support from Australian constituents through an extensive due process (ASCPA and ICAA, 1997). The professional accounting bodies were also concerned by the apparent lack of transparency and accountability of the FRC. They noted that the role of the FRC should not be confused with that of the consultative group and project advisory panels.

The views of the professional accounting associations and the corporate sector can be considered in terms of the regulatory capture theory discussed earlier. Both groups opposed the adoption of IASs on 1 January 1999,[13] which, if Walker (1987) and Rahman (1992) were correct, would be consistent with attempts to maintain their control over standard setting in Australia. If IASs were adopted in lieu of domestic standards, these groups would have much less influence over their determination. The introduction of the FRC proposed by CLERP and the reorganization of AARF would further reduce the professional associations' influence. However, the associations expected some return for continuing their funding commitment. They wanted 'strong representation and involvement above other groups' (ASCPA and ICAA, 1997, p. 5), which they saw as critical to the success of any new arrangement. In particular, they argued that a significant proportion of the FRC (including the chair or deputy chair) should be drawn from their membership. The corporate sector's response to CLERP #1 could reflect a realization that they, too, would have less influence on an international than a national standard setter. Australian companies have submitted comments on IASs,[14] but the relatively small number and size of Australian firms would suggest they will have much less influence in the future, as more countries take part in the IASC and the U.S.A. becomes more heavily involved. That some members of the corporate sector are not ready to delegate domestic powers to an international standard setter was indicated clearly by their reactions to IAS 38, *Intangibles*.[15]

[13] The ICAA supported the pursuit of global standards, the development of Australian standards that harmonized with IASs, as per Policy Statement 6 (ASCPA and ICAA, 1999) and the adoption of IASs if this was in Australia's best interests. ASCPA, although a supporter of Policy Statement 6, was more reserved about adopting IASs.

[14] Larson (1997) and Vietze and Chatham (1998) discussed lobbying of the IASC by U.S. and Australian companies.

[15] See Tabakoff (1999).

Several accounting firms expressed concerns about the adoption of IASs in Australia before the standards are recognized in the world's major capital markets. Limitations in the IASC's 'due process' were noted. One firm argued strongly that Australia would not be able to influence international standard setting without maintaining strong technical expertise at home (Coopers and Lybrand, 1997). Another observed that it was of great importance that the FRC promoted rather than diminished the independence of the AASB (Price Waterhouse, 1997).

Academics commented on a broad range of issues raised by the proposals, including: the wisdom of adopting IASs, considering the situation in other capital markets; whether law making capability should be delegated 'en masse' to an international body; and the effect adoption could have on the quality of Australian financial reporting, Australia's standard setting capability and its ability to influence international developments. Accounting academics at the University of Newcastle (1997) offered the view that in the past some stakeholders, particularly preparers, have had too great an opportunity to influence the content of standards, to the detriment of users of financial data. Another submission noted that the public interest should be paramount in any proposed restructure of standard setting (Monash University, 1997). Representation of the academic community on the FRC was also requested (University of Western Australia, 1997; University of Tasmania, 1997; AAANZ, 1997).

Public sector organizations commenting included Treasury departments and audit offices of several states. They noted that IASs are not used by 'domestic' firms in the leading capital markets. Departments also questioned the applicability of IASs to the public sector, since they are private sector standards. The submissions recommended that there be a public sector representative on the FRC.

Interest group theory maintains that even the regulator acts in a self-interested way. If the AASB and PSASB are viewed as regulators, their actions should be evaluated in terms of self-interest. The AASB had approached the government to obtain changes in its structure and funding to improve its operations and output. However, the proposals that emerged included other matters, which the AASB considered detrimental. The AASB contacted all the other interest groups to communicate the concerns they stated in their submission to Treasury. It queried the adoption of IASs in view of their quality and level of acceptance in international capital markets. It also questioned the strength of Australia's influence on the determination of an IASC standard if it were pre-committed to adopting the standard anyway (AASB, 1997). The same concerns were expressed by other respondents, but not by the ASX. The PSASB explained that present IASs would be inadequate for public sector organizations. IASs were undergoing review by the International Federation of Accountants (IFAC) for their applicability to the public sector. They would require modification and could need to be supplemented by IFAC's Public Sector Committee standards (PSASB, 1997). The same issue was raised by other respondents. Since the AASB and PSASB views were shared by others, it is not appropriate to argue the boards' position solely reflected self-interest.

The AASB enlisted the support of the U.S. and U.K. standard setters in arguing its case. The U.K.'s Accounting Standards Board (ASB) stated that a commitment to adopt IASs would not be acceptable to the U.K. financial community as it values independence in setting standards (ASB, 1997). While the ASB would prefer to harmonize with the internationally derived standard, if that standard was not acceptable in the U.K. then a different standard would be adopted. The ASB would not be bound to accept an IAS, whether or not it was represented on the committee that produced the standard, if it believed the IAS was inappropriate for the U.K. In other words, the ASB was opposed in principle to 'wholesale adoption'.

The ASC[16] agreed with continued harmonization of Australian standards with IASs,[17] but considered automatic adoption of IASs in Australia as 'ambitious and premature' (ASC, 1997, p. 3). It highlighted the issues of the applicability and quality of IASs, and the importance of the other components in a regulatory system to producing useful information for investors. In citing these views, the ASC defended the quality of Australian standards as important to the welfare of the securities market, a position argued adamantly by SEC Chairman Arthur Levitt in relation to the U.S.A.'s markets (Levitt, 1997).

Despite the widespread opposition, ASX maintained its position that adopting IASs would dissuade Australian listed companies from taking their primary listing overseas. The ASX submission strongly supported the timing and content of CLERP #1's 'wholesale adoption' proposal (ASX, 1997). Interestingly, it is not necessarily the case that ASX support of IASs will be in its self-interest in the longer term. Brown and Clinch (1998) propose a scenario quite the opposite of that envisaged by the ASX: one where the U.S.A., U.K., Australia, New Zealand, Japan and Canada all adopt the same accounting standards, which reduces barriers to entry in the market for stock exchange services and thereby decreases the likelihood that the ASX, as it now exists, would survive.

In sum, of the thirty-two respondents commenting on this proposal, only two (ASX and IASC) favoured it. Sharpe's letter, written as chairman of the IASC, endorsed the proposals as sensible and recommended them as a model for other countries. Sharpe had been actively promoting IASs in Australia and must have been pleased to see the proposal, to adopt IASs, in the CLERP #1 draft.

The FRC

The proposal to appoint a committee (the FRC) to oversee the Australian standard setter follows the lead of the U.S.A. and U.K. and introduces another level in the process. The problem with the FRC is not the idea of having the AASB answer to an oversight body—thirty out of thirty-two submissions supported that concept—but rather the extent of its powers over the standard setting process. Representation on the FRC will now be important in determining the power of participants in the standard setting process. Several submissions commented on the importance of the composition of the FRC, and some groups indicated their willingness to serve on it.

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[16] The ASC became the ASIC on 1 July 1998.

[17] The harmonization project (1997–8) saw Australian standards revised so that compliance with them would ensure compliance with IASs.

One corporation recommended that at least a third of the FRC's members be preparers of financial statements, claiming that 'only preparers take a commercial perspective' (CBA, 1997). The professional accounting bodies recommended that they have two nominees on the FRC and bodies from academia and the public sector sought representation as well.

Twenty-one respondents expressed concern about accountability, membership and structure of the AASB and FRC (ASCPA and ICAA, 1998). Several respondents questioned the FRC's power to approve the AASB's priorities, believing it could undermine the AASB's independence. The comment was made in several submissions that the AASB, not the FRC, should decide when to depart from an IAS. The AASB considered the proposal to allow the FRC to approve the priorities of the standard setter would compromise the AASB's independence, and may relegate the FRC to a lobbying forum (AASB, 1997). The PSASB suggested the FRC should not replace the consultative groups since it could not then be effective as an oversight committee (PSASB, 1997).

In relation to the suggestion that a key role of the FRC should be to ensure that the standard setter is committed to, and works towards, adoption of IASs, the ASC considered that the FRC should have flexibility and not be bound to carry out this role (ASC, 1997). The ASC noted that funding of the AASB must be sufficient to maintain full standard setting capability for the present, as well as supporting greater involvement in the IASC. While endorsing the principle of user pays for standard setting, the ASC noted the difficulty of achieving this (ASC, 1997). The NIA stated independence for the standard setter requires independent funding. It argued for government funding to show independence from the accounting profession and to prevent the process being controlled by any one group. It noted that the government assisted with funding in the U.S.A. and U.K., not relying solely on markets, beneficiaries and self-regulation (NIA, 1997). The Companies and Securities Advisory Committee (CASAC), a statutory committee that advises the Treasurer on the Corporations Law, argued that the FRC should not be an intrusive body, and that standard setters should follow the established due process and be 'appropriately insulated from undue influence' (CASAC, 1997, p. 10).[18]

Commenting on the proposed FRC, the U.K.'s ASB said the FRC had too much power when compared to its U.K. counterpart, which has no power to veto ASB decisions. The ASB also discussed future standard setting by the IASC and considered that for a country to influence standard setting in the future, it would need a standard setting board with sufficient expertise and experience, which would not be present in a board that merely adopts IASs (ASB, 1997). FASB commented that it would be inappropriate for the FRC to 'have the ability to dictate or approve the priorities or agenda' of the AASB, as such a structure removes any real authority from the AASB. In addition, project advisory panels should not be appointed by the FRC, as the AASB should be able to seek advice from any party whenever necessary (FASB, 1997, p. 2).

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[18] CASAC had this to say about institutional arrangements appropriate for standard setting:

> The main objective should be to establish a due process, to be followed transparently by a group of standard setters who are appropriately insulated from undue influence yet who are sufficiently well informed of the economic consequences of the alternative courses of action they are considering. The overseeing body must have confidence in the capacity of the individuals who collectively set the standards to exercise sound group judgement, because the conflicting interests of those affected by the standard unavoidably must be traded off in reaching a position. Setting optimal accounting standards is an impossibly difficult task from a strictly economic point of view. But standards must be set anyway. (CASAC, 1997, p. 10)

THE GOVERNMENT'S RESPONSE

These submissions and those made to the Joint Parliamentary Committee on Corporations and Securities (Commonwealth of Australia, 1999a) resulted in various modifications to CLERP #1's proposals and in amendments to the CLERP Bill 1998 before it was passed by Federal parliament in October 1999. The changes are summarized in Table 4.

The adoption of IASs from 1 January 1999, as proposed by CLERP #1, did not eventuate but the AASB may use or modify 'an international accounting standard' in making an accounting standard (s. 227, 3). Reference to the standards of the IASC was replaced by the non-specific term 'international accounting standard'. The direction to the FRC to ensure the AASB is committed to the adoption of IASC standards was changed to refer instead to monitoring the development of 'international standards' and promoting a greater role for them in Australia (s. 225, 2f). However, the government has maintained the ability to influence the process in favour of international standards through s. 233, which allows the Minister to give a direction to the AASB about the role of international accounting standards, which are defined in the legislation as the standards of the IASC or another body 'specified by the regulations' (Schedule 4, part 3, 8). As for which standards, the Commonwealth government still supports the development of IASC standards as the global solution. This was clearly indicated in a speech by the Minister for Financial Services and Regulation, which noted that the IASC standards have the greatest prospect of being accepted as the international standards and that for Australia 'there is the need for the move to internationally accepted standards with minimal delay' (Hockey, 1999).

The lobbyists were successful in achieving changes to the requirement to adopt IASs but their comments about the FRC charter and the independence of the AASB had little effect. The FRC still has the power to set strategic direction, approve and monitor the priorities, business plan, budget, staffing arrangements, and to monitor funding arrangements and establish consultative mechanisms for the standard setter. The way the FRC will use its powers is yet to be seen and will depend on the individuals involved. Members of the inaugural FRC were announced in September 1999 (Commonwealth of Australia, 1999b). The members included the chairman, Paul Rizzo, and twelve people who were nominated variously by the Department of Finance, the Department of Treasury, the heads of State and Territory Treasuries, the ICAA, CPA Australia, ASIC, ASX, the Business Council of Australia, the Australian Institute of Company Directors, the Investment and Financial Services Association, the Securities Institute of Australia and the

TABLE 4

COMPARISON OF PROVISIONS OF CLERP #1 AND THE BILL

CLERP Proposals for Reform: Paper no. 1	Corporate Law Economic Reform Program Bill 1998
'From 1 January 1999, the AASC[a] should issue identical exposure drafts of standards for public comment to those issued by the IASC with the objective that final standards issued by the AASC would be consistent with Australian law and be the same as those issued by the IASC, unless the Government, upon advice from the FRC, determines that to do so would not be in Australia's best interests' (p. 2).	'the AASB may make or formulate an accounting standard by issuing the text of an international accounting standard. The text of the international accounting standard may be modified to the extent necessary to take account of the Australian legal or institutional environment' (s. 227(3)).
The FRC should 'ensure that the AASC is committed to, and works towards, adoption of IASC standards having regard to what is taking place in the major capital raising economies' (p. 2).	'The FRC functions are: to monitor the development of international accounting standards and: (i) to further the harmonisation of Australian accounting standards with international standards; and (ii) to promote a greater role for international standards in the Australian accounting standard setting process if doing so would be in the best interests of both the private and public sectors of the Australian economy' (s. 225(2)(f)).
	'The Minister may give the AASB a direction about the role of international accounting standards in the Australian accounting standard setting system. Before giving a direction under this section, the Minister must receive and consider a report from the FRC about the desirability of giving the direction. The AASB must comply with the direction' (s. 233).
The FRC should 'set broad strategic direction' and 'approve the priorities and business plan' of the AASC and 'monitor compliance with them' (p. 3). The FRC should oversee the 'provision of administrative and research/technical support' for the AASC (p. 3).	The FRC functions are: to 'determine the AASB's broad strategic direction' (s. 225(2)(d)) and to 'approve and monitor the AASB's priorities, business plan, budget and staffing arrangements' (s. 225(2)(c)).
The FRC should oversee the 'the consultative arrangements' and 'the funding arrangements' of the AASC (p. 3).	The FRC should 'monitor the level of funding and funding arrangements' (s. 225(2)(i)) and 'establish appropriate consultative mechanisms' (s. 225(2)(j)).
'Australia should promote moves internationally to introduce market value accounting' (p. 7).	Deleted from Bill.

[a] The AASC was the proposed name change for the AASB that did not eventuate.

Australian Shareholders Association. This group includes two partners from large accounting firms, five persons employed in the corporate sector, three public servants, two representatives of regulators and one person nominated by a non-profit organization. Thus a wide range of interest groups are represented at the FRC and most lobby groups succeeded in obtaining their goal of membership of this committee.[19]

THE FUTURE OF THE CLERP #1 PROPOSALS

The issue of the extent of use of IASs in standard setting remains important since the motivations for harmonization (at least for large companies) are strengthening as financial markets become even more closely integrated, and the cost pressures of a fully fledged domestic standard setting process are great. Therefore it is appropriate to consider whether the proposals of CLERP #1 could have achieved their desired outcomes, and whether the concerns expressed in CLERP #1 will ever disappear.

Desired Outcomes

The first outcome sought was 'a clear and relevant policy framework for the development of accounting standards to ensure they are responsive to changes in commercial practices, meet the needs of users without being overly burdensome, and improve Australia's international competitiveness'. Regardless of the standard setting framework in place, there will always be debate about due process, compliance costs and the responsiveness of accounting standards to change. The politics of standard setting, in Australia and elsewhere, often lead to excuses being proffered rather than self-interest being admitted openly. These excuses are likely to be couched in general terms, such as the charge that compliance costs are too burdensome. It is not easy for the standard setter to calculate accurately the cost-benefit trade-off for an accounting standard: cost-based excuses are hard to test. Furthermore, with respect to Australia's international competitiveness, the pre-existing harmonization policy should achieve similar capital market outcomes to wholesale adoption. For instance, if IASC standards were used by the SEC for foreign-domiciled companies then harmonization and wholesale adoption would achieve similar cost savings for Australian firms raising capital in the U.S.A.

The second hoped-for outcome was 'improved institutional arrangements for the standard setting process that will ensure that the process operates in a responsive, efficient and effective manner, thereby enabling all relevant stakeholders to participate while maintaining the independence of the process'. Commentators on CLERP #1 stated that the FRC was to be given (and presumably has been given) too much power to preserve the independence of the standard setter, while the FRC's policy of conducting its meetings in private and not publishing its agenda papers indicate a lack of transparency of its processes. The experience of strained relations between FASB and its supervisory body, the Financial Accounting Foundation, which in the past has prompted the SEC to intervene to protect the FASB from inappropriate pressure, shows that the politics of standard setting make the relationship between standard setter and supervisor a particularly delicate one (Zeff, 1998). The FRC's members will be tempted to drive the standard setting agenda and make it more overtly political. As for the responsiveness of accounting standards to changes in commercial practices, the adoption of international accounting standards would have made the standard setting system less, not more, responsive to Australia's needs. The previous standard setting process allowed for stakeholder representation via the Consultative Group, and it was more independent of vested interests than will be the case if the FRC becomes heavy-handed and exercises its powers to the full.

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[19] One lobby group that did not obtain FRC representation was the academics. However, an academic is a member of the AASB.

The third outcome sought was 'a more equitable spreading of the cost burden in respect of the funding of the standard setting process so that those who benefit from accounting standards contribute to their development'. The proposed funding arrangements appear to be more equitable, especially for the accounting profession. However, the user pays principle cannot be implemented other than very indirectly, because financial statements have large externalities. For example, the information contained in a company's annual report benefits the shareholders of all other companies in the same industry. How can we possibly get our competitors to contribute directly towards the costs of reporting to our own shareholders?

Improving funding arrangements for standard setting was an important issue that has not been resolved by CLERP #1. The legislation could have clarified funding but it was left for the FRC to organize. Thus far, the corporate community has resisted calls for contributions and funding remains as it was pre-CLERP, with the government and the accounting associations as the major contributors.[20]

Concerns

We now consider the concerns stated in CLERP #1. The first was that Australian accounting standards are not understood in, and are out of step with, the major capital markets in the U.K., U.S.A. and Europe, thereby resulting in a higher cost of capital for Australian business. However, Australian companies that list in London already have their accounts accepted by the U.K. authorities so there is, presumably, no substantial problem there. There has been no indication that the U.S.A., which is the world's largest capital market by a wide margin, will allow the use of IASs by foreign-domiciled companies that raise capital and whose securities are traded on U.S. markets without requiring reconciliation to U.S. GAAP. This has been made abundantly clear, on repeated occasions, by representatives of the SEC.[21] Also, the present policy of harmonization would achieve much the same outcome as the proposed wholesale adoption of IASs; and where, under the proposed

[20] In 2000 the NIA has joined the ICAA and CPA Australia as a contributor of funds. The ASX provided premises for the AASB (AASB, 2000).

[21] See for example Levitt (1997) and Sutton (1997).

regime, an IAS was not adopted because it was not in Australia's best interest, any 'concern' about overseas investors understanding our standards would remain unaddressed.

A second concern was that the standard setting process is perceived to be dominated by the accounting profession and there is no real accountability to its users. It is true that the proposed structure would reduce the reliance on the accounting profession for funding and involve a wider set of interests. However, the accounting profession should be defended from unfair criticism. Many accountants pride themselves on their professional independence. The profession is made up of members with diverse views on matters of judgment, such as accounting standards, and those views were not suppressed by the process that previously existed. Furthermore, the profession, as did the CLERP #1 proposal, supports the idea of a conceptual framework to limit the opportunity for undue influence by special interest groups. Moreover, the previous process indirectly held the standard setters accountable for standards' outcomes. There is no guarantee that a stronger supervisory body with less knowledge about accounting matters and more direct control of the standard setter will automatically result in 'better' accounting standards. By comparison, there is reason to believe the IASC's processes will be less transparent than Australia's, given the large number of countries with a stake in international standards and the various coalitions and interest groups that must emerge within the IASC.

A third concern was that accounting standards do not reflect modern business practices, being too prescriptive and overly technical, thereby imposing excessive costs on business. There is little reason to expect from past trends that future accounting standards will be any less technical or prescriptive,[22] although it is true that IASs are never more prescriptive than harmonized Australian standards, which logically are a subset of the treatments allowed under the corresponding IASs. However, under the proposed changes, Australian standard setters should become more sensitive to the costs and benefits of applying accounting standards to particular classes of accounting entity, such as small firms. They needed to become more sensitive, because from the viewpoint of many Australian businesses, accounting regulation has involved excessive dead-weight costs and politicians have been listening to their complaints.

CONCLUSION

The concerns expressed in the CLERP #1 proposals reflect the political forces at work in standard setting[23] and the personalities of the key players during this period. When the process is considered in its entirety, it is not clear that the concerns were well founded. Similarly, the CLERP #1 proposals were never assured of achieving the outcomes sought by the Howard Government, because they were too ambitious.

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[22] There is a contrary argument: see Brown (2000).

[23] An analysis of the CLERP #1 proposals by Collett *et al.* (1998) concluded that there was a lack of evidence that reform was required. They outlined potential problems of adoption of IASs and queried the impact of such a move on Australian accounting expertise, leadership and credibility in the world standard setting arena.

Standard setters of the future, like those of the present, will continue to respond to political forces and to balance the needs of interested parties in a process that is inescapably political in nature. Following the CLERP changes, it would be naive to imagine that the standard setter will be left to go about its business in an undisturbed manner. The post-CLERP AASB brings new people to the standard setting table, but some old issues remain. These include the desire to involve people other than accountants in standard setting, while recognizing that the technical expertise needed in standard setting resides predominantly with accountants. After completing projects of the previous board, the new board faces some controversial standards such as those on intangible assets and financial instruments which will certainly be a standard setting challenge and a test of Australia's will to harmonize.

The controversial nature of recent standards developed at the national and international level strongly suggests that standard setting will remain politically turbulent. Indeed, the action by Federal parliament in disallowing a section of an accounting standard in May 2000 has politicized further the standard setting process. Following a close vote at the AASB, the Senate disallowed a section of AASB 1015, *Acquisition of Assets*, marking the first time that the Australian parliament had intervened in standard setting in this way and showing a new opportunity for lobbying.[24] Intervention of this nature is not uncommon in other countries.

The launching of the CLERP proposals and the subsequent legislation illustrate the political actions that surround standard setting. The activities described in this article are, for the main part, consistent with the interest group theory of regulation. We observe that interest groups act to achieve their desired outcomes; and their success is linked to their influence with other lobbying groups and the regulator, which in the present case is the Commonwealth government.[25] The position taken by an interest group reflects the views of dominant individuals within that group and may change over time. The critics of CLERP #1 argued persuasively that it would have taken Australia too far too soon along the road to international accounting standards, and the government accordingly modified its position with regard to the timing and extent of IASs adoption. However, critics were not as successful in modifying proposals relating to the powers of the FRC.

Pressure still exists for the internationalization of accounting standards. If Australia were to go down the path of wholesale adoption of IASs, the regulators, users and corporate reporters would experience first-hand the very real costs and consequences of adopting externally determined standards. For instance, there are fundamental issues still to be faced in relation to the true and fair override, changes in the basis of revaluation of assets, the range of treatments for employee superannuation entitlements, accounting for financial instruments and the mandatory amortization of intangible assets.

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[24] Ravlic (2000) described the events surrounding the disallowance of a section of AASB 1015.

[25] Interest group theory refers to influence over the regulator. In this article, the regulator is the law maker, not the enforcement agency.

So what is the future of Australian accounting standards? In the long term, globalization of accounting standards would seem an inevitable consequence of the progressive integration of financial and product markets. When it happens, the shift to wholesale adoption of IASs (or any other external standards) will leave Australian standard setters with a diminished role. Their influence in the formulation of an IAS must be less than it has been in the past since, apart from the effect of the enlarging of the IASC's membership that is already taking place, Australia's bargaining power would be curtailed because it would be pre-committed to adopting the international standard anyway. Australian standard setters would not be able to justify the same resources as had been the case in the past. A likely outcome would be a general decline in the level of domestic accounting standard setting expertise. Australia's ability to contribute in international forums would be reduced, as would the likelihood of representation on the IASC boards and committees. Apart from some limited research work as an outside contractor, the role of the Australian standard setters primarily would be to lobby the international standard setting body on behalf of Australian business. That is a far cry from Australia's strong leadership role in the past.

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APPENDIX A

AAANZ	Accounting Association of Australia and New Zealand
AARF	Australian Accounting Research Foundation
AASB	Australian Accounting Standards Board
ABA	Australian Bankers Association
AICD	Australian Institute of Company Directors
ASB	Accounting Standards Board
ASC	Australian Securities Commission
ASCPA	Australian Society of Certified Practising Accountants (now CPA Australia)
ASIC	Australian Securities and Investments Commission
ASRB	Australian Standards Review Board
ASX	Australian Stock Exchange
BCA	Business Council of Australia
CASAC	Companies and Securities Advisory Committee
CBA	Commonwealth Bank of Australia
CLERP	Corporate Law Economic Reform Program
ED	Exposure Draft
EU	European Union
FASB	Financial Accounting Standards Board
FRC	Financial Reporting Council
G100	Group of 100
IASs	International Accounting Standards
IASB	International Accounting Standards Board (IASC from 2001)
IASC	International Accounting Standards Committee
ICAA	The Institute of Chartered Accountants in Australia
IFAC	International Federation of Accountants
IFRSs	International Financial Reporting Standards (IASs from 2001)
IOSCO	International Organization of Securities Commissions
NIA	National Institute of Accountants
PSASB	Public Sector Accounting Standards Board
SEC	Securities and Exchange Commission

APPENDIX B

STANDARD SETTING PARTICIPANTS

These people were interviewed during the preparation of this article:

David Boymal, Chairman, CPA Australia (1998), AASB member (1982–99)
Bruce Brooke, ANZ, Chairman, G100 (1996–8)
Ian Campbell, Federal Parliamentary Secretary (1996–8)
Brigid Curran, PricewaterhouseCoopers, AASB member (2000–ongoing)
Bryce Denison, Wesfarmers, President, G100 (1998–2000)
Ian Hammond, PricewaterhouseCoopers, AASB member (1991–9), IASC member (1998–2000)
Geoff Harris, G100 National Executive Coordinator (1995–ongoing), AARF staff (1995–9)
Steven Harrison, CEO, ICAA
Wayne Lonergan, PricewaterhouseCoopers, Chairman, SIA (1997–2000), AASB member (1992–9)
Warren McGregor, Director, AARF (1989–9)
Robert Nottle, ASX
Colin Parker, Technical Director, CPA Australia
Les Pascoe, Policy Unit, Treasury, Canberra
Graham Peirson, PSASB member (1990–9)
Keith Reilly, Technical Director, ICAA
Michael Sharpe, Chairman, IASC (1995–7)
Ken Spencer, Chairman, AASB (1995–9)

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ROBERT H. PARKER AND RICHARD D. MORRIS

The Influence of U.S. GAAP on the Harmony of Accounting Measurement Policies of Large Companies in the U.K. and Australia

U.S. GAAP has increasingly become an influence on accounting practices in other countries, even aside from those traditionally considered under direct U.S. influence. The change arises from the large number of U.S. accounting standards, non-U.S. companies listing on U.S. stock exchanges, and the amount of U.S. direct investment abroad. As the impact of U.S. GAAP varies across countries, it may affect international accounting harmony. This idea is tested by examining the level of international harmony for eleven accounting measurement policies in matched pairs of large companies from Australia and the U.K., two countries with historically strong cultural and economic links. It is argued that, in recent decades, accounting practice in Australia, more so than in the U.K., has become increasingly U.S.-oriented. The concepts of harmony of Tay and Parker (1990) and Archer *et al.* (1996) are employed. International harmony is measured by the between-country C index and chi-square test; national harmony by van der Tas's (1988) H index. While considerable national harmony is found in the U.K. for seven and in Australia for five accounting policies, there is considerable or complete international harmony for only three policies. Evidence is presented of the influence of U.S. GAAP as one factor explaining the poor degree of U.K./Australia international harmony. Australian companies appear to follow U.S. GAAP to a greater extent than do U.K. companies. The state of partial harmony thus existing restricts international comparability of accounting reports and may cause problems for regulators.

Key words: Accounting policies; Comparability; Harmonization; Harmony; Standardization; U.S. GAAP, U.K., Australia.

INTRODUCTION

This article examines the influence of U.S. GAAP as an impediment to the international harmony of accounting measurement policies between other countries. The

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study is prompted by the current widespread interest in international harmonization of accounting standards. It is also prompted by the international influence of U.S. GAAP flowing from that country's major contribution (via accounting standards and similar pronouncements) to solutions for financial reporting issues, its capital markets as a source of finance for non-U.S. corporations, and its substantial direct investments abroad. U.S. GAAP can impede international harmony by creating partial harmony whereby some but not all countries follow U.S. GAAP. Partial harmony restricts international comparability of accounting reports, thereby causing problems for regulators seeking to increase international harmony of accounting standards and practices. This influence of U.S. GAAP is examined by studying the harmony of accounting measurement policies of large companies in the U.K. and Australia in 1993. Although traditionally considered close because of historical, cultural, legal and economic links, the two countries have in fact diverged for some years due to the U.K.'s entry into the EU and an increasing U.S. influence on Australian accounting. The year 1993 falls in a period where differences between U.S. GAAP and that of other countries were receiving publicity, as illustrated by the large discrepancy between Daimler-Benz's 1993 earnings in U.S. GAAP versus German GAAP, revealed after the company listed on the New York Stock Exchange (Mueller *et al.*, 1997, p. 28). The International Accounting Standards Committee (IASC) agreed in 1993 on the first ten revised standards of its Comparability/Improvements Project, but the lengthy process of obtaining endorsement of International Accounting Standards (IASs) for cross-border securities' listings had not then progressed far enough for IASs to be a serious confounding factor in our study. Considerable national harmony is found within the U.K. and Australia for most of the accounting policies examined. However, there is only minimal international harmony between these countries, due apparently to a greater tendency in Australia than in the U.K. for companies to conform broadly to U.S. GAAP.

Background

International Harmonization Recently, increasing interest has emerged in international harmonization of accounting standards. Well-known examples are the European Union's (EU's) company law harmonization program, standards issued by the IASC, and the work of the International Organization of Securities Commissions (IOSCO). The EU's programme produced a series of directives to be implemented by each member state. The Fourth and Seventh Directives contained wide-ranging and, for some countries, radical accounting proposals. The IASC has, as one of its objectives, increasing harmony of accounting standards internationally (Wyatt, 1989, p. 106). It has long sought international acceptance of IASs, particularly for cross-border securities listings. IOSCO, with members from the securities commissions of many countries including the U.S., the U.K. and Australia, has encouraged, but has also been a demanding critic of, the IASC's harmonization efforts.

The IASC's harmonization efforts have borne fruit slowly. Early IASs were criticized for their permissiveness (for example, see Walker, 1978). The Comparability and Improvements Project (1989–93) aimed at reducing flexibility in IASs

(Salter and Roberts, 1996, p. 24; Ma *et al.*, 1997, p. 493) resulted in a set of revised, tighter IASs. Flexibility remained. IOSCO refused to endorse all the revised IASs for cross-border securities listings. In 1994, IOSCO identified a set of 'core' IASs, further work on which it wished to see satisfactorily completed (Schweikart *et al.*, 1996, p. 113; Zeff, 1998). An agreement between IOSCO and the IASC in July 1995 was to allow these core IASs, if endorsed by IOSCO, to be accepted in place of domestic standards for cross-border securities listings (Ma *et al.*, 1997, p. 495). This agreement was followed by the EU signalling that large European multinational corporations should be able to use IASs provided that these are consistent with the Fourth and Seventh Directives (Commission of the European Communities, 1995, paras 1.4, 5.1–5.9; Flower, 1997). In April 1996, the U.S. Securities and Exchange Commission (SEC) stated that it would consider recognizing the core IASs for foreign corporations issuing securities in the U.S., provided certain conditions were met (Levitt, 1997). The IASC substantially completed the key components of its core standards work program in March 1999 with the publication of an interim standard on financial instruments. And in May 2000, IOSCO finally announced that it would endorse these standards for cross-border securities' offerings. However, countries can still require 'supplementary treatments' including reconciliation of IAS GAAP with domestic GAAP (IOSCO Report on IAS, 2000). An EU policy document issued in June 2000 proposed that all EU countries should require their listed companies to adopt IASs in consolidated accounts by 2005 at the latest (EU Financial Reporting Strategy, 2000).

International harmonization of accounting standards, *via its impact on practice*, is said to improve the allocation of goods, labour and capital in international markets, to reduce firms' costs of capital and operating expenses, and to facilitate social control of multinational corporations (Most, 1994).[1] These advantages purportedly arise because harmonization will, among other things, increase the comparability of accounting reports between countries (Wyatt, 1989, p. 107; Meek and Saudagaran, 1990, p. 167; Saudagaran and Meek, 1997, p. 10). Comparability is one of the qualitative characteristics of accounting information in Conceptual Framework documents (see Belkaoui and Jones, 1996, ch. 7). *Ceteris paribus*, the greater the level of harmony in accounting standards, the greater should be the level of comparability between accounting reports.

Ironically, the EU's and the IASC's efforts can also impede harmonization because they influence some but not all countries. Partial harmony is thus created, whereby harmony between two or more countries may result in disharmony with other countries. After the Fourth and Seventh Directives, accounting regulations of EU countries may be in harmony but not with non-EU countries. Countries that adopt IASs as domestic GAAP (there were twenty-nine such countries in early 2001, IASC, 5 March 2001) have their accounting standards in harmony but not necessarily with those of other countries. U.S. GAAP can likewise impede international harmonization and thus create another instance of partial harmony.

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[1] These alleged benefits have not gone unchallenged. Criticisms of harmonization are reviewed in Meek and Saudagaran, (1990, p. 168), Most (1994), Saudagaran and Meek (1997, p. 11).

U.S. GAAP as an Intervening Variable U.S. GAAP has long been a major source of authority on financial accounting issues internationally, as even the most casual glance at English-language non-U.S. financial accounting textbooks will attest. With the work of the Financial Accounting Standards Board (FASB) and the proliferation of its Statements of Financial Accounting Standards, this influence is growing and is twofold. First, U.S. GAAP influences other countries' accounting standards. Because of historical and/or geographical factors, accounting standards in countries such as Canada, Indonesia, Japan, Mexico, Panama, the Philippines and Taiwan are or have been strongly influenced by U.S. GAAP (Nair and Frank, 1980, p. 429; Diga, 1997, ch. 9; Wu *et al.*, 1997, ch. 11; Nobes, 1998a, pp. 58, 61; Rahman, 1998, table 2). However, even in countries outside this sphere, U.S. GAAP has an impact. For example, current standards on translation of foreign subsidiaries' balance sheets in Britain and Australia are based on SFAS 52 (Eddey, 1995, pp. 386–7; Flower, 1998). Second, U.S. GAAP, via its aforementioned impact on foreign accounting standards, influences the *practices* of non-U.S. corporations. But U.S. GAAP also has more direct influences on non-U.S. practices. For example, the Securities and Exchange Commission (SEC) requires non-U.S. corporations with securities listed on U.S. stock exchanges to provide a reconciliation between their own reported earnings and those that would have been reported if they had followed U.S. GAAP (the Form 20-F filings). In 1994, there were 217 such corporations listed on the New York Stock Exchange, 325 on Nasdaq and 74 on the American Stock Exchange (Gray and Roberts, 1997, p. 194). The requirement provides an incentive for these corporations to comply if possible with U.S. GAAP to minimize costs. The U.S. is a very large investor in other countries. Of OECD countries, the U.S. had the largest direct investment outflow from 1990–8 (OECD 2000, chart 2); and in 1998 twenty-six of the world's top hundred transnational corporations (ranked by foreign assets) were American (UNCTAD, 2000). U.S. foreign investment creates a demand in host countries for U.S. GAAP in reporting to U.S. investors. Finally, foreign companies not contemplating listing in the U.S. may adopt U.S. GAAP because it is perceived to be more comprehensive, more conservative, less flexible, or in some other way better, than either domestic standards or the IASs.

The Influence of U.S. GAAP in Australia Traditionally, accounting in Australia and in the U.K. have been considered similar because of the historical, legal, cultural and other links between the two countries. Until 1961, most Companies Acts in Australia were based on U.K. precedents (Morris and Barbera, 1990). Recommendations issued by the Institute of Chartered Accountants in Australia between 1946 and 1963 were very closely based on those issued by the Institute of Chartered Accountants in England and Wales (Zeff, 1973, p. 3). In a classification based on 1973 measurement practices data, Nair and Frank (1980, p. 429) placed the U.K. and Australia, but not the U.S., in the same group, as did Nobes (1998a, p. 58) in a classification albeit based on 1980 data.

Over the past twenty to thirty years, however, Australian accountants have been perceived as moving away from the U.K. and towards the U.S. (Morris and Barbera, 1990, p. 238), at the same time that the U.K. has been increasingly influenced by its fellow member states of the EU. Gibson (1979, p. 33) noted the 'change in orientation':

> The first recommendations of the [Australian] accounting profession [were], in essence, the English equivalents with Australia substituted where necessary for England and Wales. In more recent times there has been, however, a noticeable turn towards the American profession and the influence of American thinking is found readily in the more recently issued [i.e. late 1970s] standards.

Philp (1993, p. 19), an Australian accounting practitioner, stated: 'Australia has made good progress in developing standards very much in accord with those of the United States'. Miller (1994, p. 340) observed that the U.S. is the most important external influence on accounting and auditing in Australia, although Australia is eclectic in following overseas initiatives and has itself taken an important role in the IASC.

Furthermore, from the late 1960s onwards formal links were established 'between existing local firms and the big international accounting firms most of which, regardless of their historical origins, are perceived to be directed principally from their American offices' (Gibson and Arnold, 1981, p. 58). The setting of formal auditing standards, developed first in the U.S., was taken up in Australia before it was in the U.K. Australian standard setters followed U.S. rather than U.K. precedents on tax effect accounting even to the extent of providing a rule appropriate to the treatment of future tax benefits of tax losses in the U.S. which was not relevant in Australia (Gibson, 1984). Goodwill and accounting for the extractive industries are other cases where Australia has been aligned more with U.S. than with U.K. regulations (Brunovs and Kirsch, 1991, p. 155; Luther, 1996, p. 76).

One possible reason for this change in orientation has been the increase in foreign direct investment (FDI) from the U.S. and a decline in FDI from the U.K.: 'For most of Australia's recent history, the United Kingdom and the United States have been major sources of FDI. However... Australia's reliance on the United Kingdom as a source of FDI has fallen considerably since 1984–85' (Bureau of Industry Economics, 1996, pp. 7–8). From 1985 to 1998, FDI inflow to Australia from the U.S. amounted to A$29,404m, about double that from the U.K. which at A$14,508m was the second largest source (OECD, 1997, p. 25; OECD, 2000, pp. 41–2).

The influence of U.S. GAAP on Australian versus U.K. accounting *practices* has not been previously studied. Glimpses are discernible from three studies which examined the Form 20-F filings of U.K. and Australian companies listed on U.S. stock exchanges. Weetman and Gray (1991) showed that, for forty-one such U.K. companies, profits from 1986–8 calculated using U.K. accounting standards significantly exceeded profits using U.S. GAAP. Weetman *et al.* (1998) found that, for twenty-five of these U.K. companies, the gap between the two sets of profits had increased by 1994. Norton (1995) conducted a similar study for thirteen U.S.-listed Australian companies for 1985–93. She found that reported profits using Australian accounting standards did not on average differ significantly from profits using U.S. GAAP, although there was wide variation across companies. She did find some significant differences for shareholders' equity. In sum, for these U.S.-listed companies, Australian practice appears closer to U.S. GAAP than does U.K. practice.

Therefore, it is worth examining the extent to which in the 1990s there was greater influence of U.S. GAAP on the accounting measurement policies[2] of Australian companies than on U.K. companies. This is done by measuring between-country or international harmony in a selection of large U.K. and large Australian companies. The proposition tested is that such harmony is relatively low and that this can be explained, at least in part, by the greater influence of U.S. GAAP on large Australian companies than on large U.K. companies. It is further posited that the influence is not restricted to Australian companies listed on U.S. stock exchanges but extends to large Australian companies generally. In order to test these propositions, use is made of some of the measures of harmony developed by, among others, van der Tas (1988, 1992a, 1992b) and Archer *et al.* (1995). Data are drawn from 1993 annual reports of U.K. and Australian companies.

HARMONY AND HARMONIZATION

Before proceeding, the terms 'harmony' and 'harmonization' of accounting measurement policies are defined, and their relationship to 'comparability', 'standardization' and 'uniformity' is clarified. There are many definitions of harmony and harmonization in the literature.[3] Tay and Parker (1990, p. 73) defined harmony as a clustering of companies around one or a few available accounting methods, and harmonization as a movement away from total diversity of accounting methods. Harmony is a state measured at a point of time, whereas harmonization is a process measured by comparing harmony at different times (as in Emenyonu and Gray 1996).

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[2] It would be also possible to examine accounting disclosure policies. Both measurement and disclosure policies are subject to U.S. GAAP and have been the subjects of international harmonization. Nair and Frank (1980) have shown the importance of distinguishing between measurement and disclosure when classifying national financial reporting systems. Van der Tas (1992a) provides schema for classifying levels of disclosure and measurement harmony. However, the present article follows previous studies (e.g., van der Tas, 1988; Emenyonu and Gray, 1992, 1996; Tay, 1994; Archer *et al.*, 1995; Hermann and Thomas, 1995; Tarca, 1998) in being restricted to measurement policies, which arguably are more interesting in that they affect earnings per share and other important ratios.

[3] As summarised in Falk (1994, p. 600), harmony has been described as a state in which 'many member bodies share a sufficient level of individual needs and grievance to produce a common purpose' (Wallace, 1990, p. 10); standards and practices 'do not logically conflict' (Choi and Mueller (1992, p. 257) or accounting 'choices are permitted under very special circumstances' (Wolk and Heaston, 1992, p. 96), while harmonization is a 'process of setting boundaries to the degree of variation among accounting practices' (Arpan and Radebaugh, 1985). Van der Tas (1988, p. 157; 1992a, p. i) defined harmony as the correspondence between two or more objects at a particular point in time; and harmonization as an increase in harmony, that is a coordination or tuning of two or more objects. To Meek and Saudagaran (1990, p. 169), harmonization 'implies a reconciliation of different points of view and permits different requirements in individual countries as long as there is no logical conflict', while Nobes (1998b, p. 117) defined harmonization as 'a process of increasing the compatibility of accounting practices by setting bounds to their degree of variation'.

Tay and Parker (1990) distinguished between de jure and de facto harmony. De jure harmony refers to the extent that regulations in companies acts, accounting standards, etc. are aligned. De facto harmony refers to what companies actually do, that is to their disclosed accounting practices (Parker 1996, p. 317). Alternatively, van der Tas (1988, p. 158; 1992a, chs 2, 3) distinguished between *formal*, *material* and *spontaneous* harmonization; and this can also apply to harmony. Formal harmonization is the harmonization of regulations (see Rahman *et al.*, 1996); material harmonization refers to accounting practices as influenced by regulations or by market forces; while spontaneous harmonization arises from market forces and not from regulations. De jure harmony and formal harmony are equivalent terms, as are material harmony and de facto harmony, while spontaneous harmony is a subset of material harmony. Both regulations and market forces influence the accounting policies examined, so, consequently, the current study entails consideration of de facto or material harmony.

Tay and Parker's harmony is on a continuum. At one end zero de facto harmony or complete diversity means each company uses a different method to account for a given item; at the other end complete de facto harmony—also called uniformity—means that every company uses the same accounting method. Similarly, there is zero de jure harmony if different rules apply across countries, and complete de jure harmony if the same rules apply. However, complete de jure harmony does not imply complete de facto harmony, either because the uniform rules may permit several accounting methods or the rules may not be rigorously enforced.

Tay and Parker (1990, pp. 73–4) also distinguish between harmonization and standardization. Standardization is an analogous process to harmonization but applies to situations where regulations and practices are, or are becoming, increasingly strict or rigid. Standardization 'generally means the imposition of a rigid and narrow set of rules, and may even apply a single standard or rule to all situations' (Choi *et al.*, 1999, p. 248). Van der Tas (1992a, pp. 31–2) considers standardization as part of the harmonization process rather than a separate concept.

De jure and de facto harmonization and standardization are usually measured between countries, but can also occur over time *within* a single country.[4] A high level of within-country de facto harmony is a necessary but not sufficient condition for between-country de facto harmony, as there can be little between-country harmony if there is low within-country harmony. De facto uniformity between countries implies de facto uniformity within them. However, de facto uniformity within countries and zero international harmony are possible on, say, depreciation accounting because all companies in country 1 use straight line, all in country 2 reducing balance, all in country 3 sum of digits depreciation, and so on.

Tay and Parker's view of harmony can conflict with comparability. International differences in economic circumstances, financing arrangements, legal structures, cultures and the like can lead to different accounting choices. For example, one firm might choose FIFO, another LIFO for valuing inventory because each has physical flows of goods corresponding to the flow assumption in the method chosen. These firms are not in complete harmony (by Tay and Parker's definition) but arguably their accounts are still comparable. Different economic circumstances of firms are allowed for by standards permitting several inventory accounting methods. Consequently there could be a high level of de jure harmony between countries (van der Tas's; 1992a, p. 47 'identity with options') but a low level of de facto harmony.

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[4] De jure harmonization can occur within a country where conflicts among that country's different rules, for example, in its companies acts, stock exchange listing rules and accounting standards, are removed. In Australia, a good example of de jure harmonization is the various attempts since 1901 to make uniform the Companies Acts of the different states (see Morris and Barbera, 1990).

The difficulty has been addressed by Archer *et al.* (1996) and McLeay *et al.* (1999). They propose an alternative approach to harmony, harmonization and standardization which simultaneously allows for within-country, between-country, inter-temporal, and firm-specific differences in accounting policy choice (hereafter, Archer *et al.*'s 1996 view). They define harmony as a state where *ceteris paribus* 'the odds of selecting a given accounting method are identical in each country', that is 'accounting policy frequency distributions are identical across countries' and harmonization occurs when those distributions become aligned over time (Archer *et al.*, 1996, pp. 1, 8, 9). Standardization is defined as a process 'which constrains choice and results ultimately in the adoption of the same accounting method by all firms in all countries . . . International standardization . . . is an increase in the unconditional probability that a particular accounting method will be adopted by firms' (McLeay *et al.*, 1999, p. 43).

Tay and Parker's view of harmony and that of Archer *et al.* (1996) are conceptually different. The case where N firms from each of X countries each used one of N different methods to depreciate fixed assets would be zero international harmony to Tay and Parker (strictly, as $N \to \infty$) but could be perfect international harmony to Archer *et al.* The latter's view of harmony assumes that diversity in accounting choices reflects real underlying differences, and opportunistic policy choices ('creative accounting') are random events. McLeay *et al.*'s (1999) view of standardization allows for regulatory attempts to narrow choice for whatever reason, including curbing creative accounting. Tay and Parker's view of standardization (and harmonization) assumes that less diversity is better. So, Archer *et al.*'s and Tay and Parker's views of standardization may be compatible, but their views of harmonization are not.

Fortunately, the incompatibility between the two views of harmonization can be reconciled, not conceptually but for practical purposes. Van der Tas (1992a, pp. 83–4) argues that harmonization (in Tay and Parker's sense) of financial reporting is a necessary but not sufficient condition for comparability. Harmonization makes comparability easier by reducing financial reporting diversity allowing real underlying differences to be pinpointed better. However, 'we must for each case seek an optimal trade-off between the abolition of differences in measurement methods on the one hand and the need on the other hand to avoid rigidity which would work against other qualitative characteristics of accounting information' (van der Tas, 1992a, p. 84). Accordingly, as detailed shortly, a scheme is introduced for classifying less than complete de facto harmony (in Tay and Parker's sense). In this article measurement methods that reflect both competing views of harmony are also used. And, as differences in, say, economic circumstances, legal frameworks can cause problems in measuring accounting harmony, these are controlled for in our sampling procedures.

RESEARCH DESIGN

Choice of Countries

Australia and the U.K. were chosen because they are two countries with strong historical and cultural links, similar accounting professions, legal systems and capital market structures. By comparing accounting practices from both countries, these factors are controlled for.

Choice of Companies

Large companies were chosen because international harmonization is much more important for them since they are more likely to attract foreign investors, to borrow or to operate abroad. Large companies are thus more likely to experience an international capital market demand for information above that from their domestic capital market. Hence they are more likely to use internationally recognized standards such as IASs or U.S. GAAP.

Sampling Procedure

Data from 1993 published accounts were collected. At the time differences between U.S. and other GAAPs were being publicized, and IASs were still not rigorous enough to constitute a major confounding factor in the analysis. The sampling procedure began by choosing U.K. companies from the top 60 in *The Times 1000*, 1994 edition, which excludes financial institutions and measures size by turnover based on 1993 data. Turnover has the advantage of producing less volatile rankings than does, for example, market capitalization. Excluded from the U.K. top 60 were private companies, the fully owned subsidiaries of North American and Japanese companies, and state-owned enterprises (the Post Office, British Coal, British Rail) because their accounting policies may have been influenced by lack of public interest in their accounts, overseas parent's policies or government policies, respectively. Five privatized companies (British Airways, British Telecom, National Power, PowerGen and Rolls-Royce) were also excluded because of the difficulty of matching them with non state-owned Australian companies. Finally, the retail group Isoceles was excluded—it was in the process of reconstruction and thus may have had accounting policies influenced by these unusual circumstances. This left forty companies.

The forty U.K. companies were matched with forty Australian companies on the basis of industry and size, the latter measured by 1993 turnover using the Statex database supplied by the Australian Stock Exchange and held by the Schools of Accounting and Banking and Finance at the University of New South Wales. Industry affects accounting measurement practices; for example, Foster (1986, p. 144) reported strong differences in the use of FIFO, LIFO and average cost inventory valuation methods across U.S. industries. Therefore, pairing by industry controls for factors that might drive such differences. Wherever possible, matching subsidiaries with their U.K. parent companies was avoided since the latter's accounting policies might unduly influence those of the former. For ICI, however, such a match was unavoidable.

As far as possible, listed companies were chosen. All forty of the U.K. companies were listed on the London Stock Exchange; thirty-eight of the forty Australian companies were listed on the Australian Stock Exchange. Of the two unlisted Australian companies, Davids Ltd was listed in 1994 so its 1993 accounting policies may have reflected that intention. The other unlisted company was Optus Communications, Australia's second telephone company, and one very much in the public eye, which did list in 1998. Many of our companies were multi-listed. Ten of the Australian companies were listed on the London Stock Exchange. Seventeen of the U.K. companies and seven of the Australian companies were listed or traded on a U.S. stock exchange. Three of the U.K. companies were listed on the Australian exchange. All but one of the Australian companies listed or traded in the U.S. were also listed in London. It will be observed that more Australian companies were listed in the U.K. than were listed or traded in the U.S., but that more U.K. companies were listed or traded in the U.S. than were listed in Australia. Thus, the regulations of the U.S. SEC were likely to be influential for the U.K. and Australian companies listed in the U.S. However, our hypothesis is that U.S. GAAP's influence is stronger in Australia than in the U.K., and that it applies to all large Australian companies.

Four problems were encountered when matching. First, given the smaller size of the Australian economy, the Australian companies were inevitably smaller than their U.K. counterparts. Hence Australian companies should be less concerned with international capital market pressures, as shown by the larger number of U.K. companies listed in the U.S. The size difference is a bias *against* our hypothesis about the influence of U.S. GAAP. Second, differences in industrial structure mean that some large Australian companies are not in the sample, given that the U.K. companies were used as the starting point. The absentees include BTR Nylex, Pioneer International and Amcor. Third, most companies selected operate in more than one industry, making matching by industry difficult. Matched companies were aligned using each one's most important industry or industries (by contribution to overall sales or profits). Fourth, thirty-five of the Australian companies were in the top 120 listed companies ranked by sales in 1993. Both unlisted companies (Davids Ltd and Optus Communications) would have been in the top 120 had they been listed. The other three companies (Mildara Blass, Village Roadshow and Blackmores) ranked 181, 219 and 230 respectively by sales in 1993. They were included because we could find no better matches for the comparable U.K. companies. Mildara Blass and Village Roadshow were in the top 150 Australian companies by market capitalization in June 1993.

Choice of Accounting Measurement Policies

Accounting measurement policies are conveniently listed in the accounting policies sections of company annual reports. Managers choose accounting policies but this is constrained by regulation. Only some companies' accounting policies were written with admirable clarity. All accounting policies were read and agreed upon by both authors. 'Accounting policies' statements of companies in one country sometimes take for granted what needs to be spelt out in other countries. For example, Australian companies seldom make it plain that they account for deferred taxation liabilities on a full provision (comprehensive allocation) rather than a partial provision basis, and U.K. companies do not always state clearly that they are using the liability rather than the deferral method. Thus, stated accounting policies were interpreted in the light of the authors' knowledge of prevailing accounting laws and standards. Care was taken, however, to do this in such a way as not to substitute a de jure harmony for a possible de facto disharmony.

A few companies explicitly disclosed the influence of U.S. GAAP and the IASs. For example, Shell and Unilever, treated here as U.K. companies, stated that they took account of Dutch and U.S., as well as U.K., accounting principles. Australian company Coles Myer stated that its financial statements conformed in all material respects with IASs on topics that had corresponding Australian accounting standards.

Excluding those measurement policies where it was not possible clearly to distinguish a number of alternative methods, or which were applicable only to a very small number of companies, data on eleven accounting policies were collected:

1. valuation of tangible fixed assets;
2. depreciation of tangible fixed assets;
3. method of inventory valuation;
4. research and development;
5. goodwill on consolidation;
6. foreign exchange translation;
7. capitalization of interest on construction;
8. capitalization of other identifiable intangibles;
9. capitalization of finance leases;
10. deferred taxation liabilities; and
11. method of depreciation.

It is not possible to assess the relative importance of accounting policies. Each policy is therefore given an equal weight in the results presented below.

Broad Conformity With U.S. GAAP

U.S. GAAP can influence practice overtly or covertly in another country: overtly, where companies outside the U.S. explicitly adopt U.S. GAAP; covertly, where non-U.S. accounting standards have rules the same as, or consistent with, U.S. GAAP and a clear link can be established between the two. U.S. GAAP comprises a vast body of rules that in general are less permissive and more detailed than those of U.K. GAAP and Australian GAAP (Biddle and Saudagaran, 1991; Adhikari and Tondkar, 1992). The greater amount of detailed prescription in U.S. GAAP compared with U.K. GAAP is comprehensively illustrated in Pereira *et al.* (1994). No equivalent comparison of U.S. GAAP and Australian GAAP has been published but the main differences appear in Miller (1994) and Norton (1995). Many differences between U.S. GAAP and the other GAAPs are trivial.

Of concern in the present paper is the extent to which the accounting measurement policies selected by large U.K. and Australian companies broadly conform with U.S. GAAP. For the accounting measurement policies selected, broad conformity with U.S. GAAP is defined as follows: all tangible fixed assets to be valued at historical cost and depreciated; inventories to be valued at the lower of cost and the mid-point of net realizable value (NRV), replacement cost and NRV less a normal profit margin (assumed to be not materially different in practice from lower of cost and NRV); research and development costs to be expensed; goodwill on consolidation to be capitalized and amortized; foreign balance sheets to be translated at closing exchange rates, foreign profit and loss accounts at average exchange rates, except in certain circumstances where the temporal method is to be used instead; interest on construction normally to be capitalized; other identifiable intangibles to be capitalized and amortized; finance (capital) leases to be capitalized and amortized; full provision (comprehensive allocation) of deferred taxation liabilities and the liability method; both straight line and reducing balance methods of depreciation permitted.

In 1993 Australian accounting standards broadly conformed with U.S. GAAP on all the above accounting policies, except the valuation of tangible fixed assets (cost or revaluation permitted), research and development (expensed or capitalized), while there were no Australian standards for interest on construction or identifiable intangibles. Australia's goodwill standard AASB 1013 requires capitalization and amortization of purchased goodwill over a maximum of twenty years; the comparable U.S. standard APB Opinion 17 has a maximum amortization period of forty years.[5] Thus, compliance with AASB 1013 would also mean compliance with APB 17. U.K. accounting standards did not conform with U.S. GAAP on goodwill (allowing either capitalization and amortization or write off to reserves) and deferred tax (partial allocation), but were otherwise broadly the same as Australian standards. Thus, Australian standards were more aligned with U.S. GAAP than were U.K. standards, although the difference is not statistically significant ($\chi^2_2 = 1.0$). U.S. standards normally precede U.K. and Australian standards chronologically and it is often possible to observe to what extent U.K. and Australian standard setters have, or have not, followed U.S. precedents. On all issues where Australian and U.K. standards broadly conformed to U.S. GAAP, the U.S. standards were issued first.

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[5] See Gibson (1984) for deferred tax; Eddey (1995) for foreign currency translation; Leo *et al.* (1995) for goodwill and identifiable intangibles. Since 1993, no significant changes in the relationship between U.S. GAAP and Australian GAAP have occurred for most of the policies listed. Both countries have adopted the balance sheet method of deferred tax. The U.S. has recently moved to abolish amortization of goodwill and instead require that goodwill be periodically reviewed for impairment (FASB, 2001).

MEASURES OF HARMONY

Analysing the results of a survey of the use of industrial concentration measures, Curry and George (1983, p. 215) note that 'The literature which considers the mathematical properties of concentration measures has not resolved the question of which is the best measure to use'. It is not surprising that the comment also applies to the much more recent literature on measures of accounting harmony. Since two different concepts of harmony are examined—Tay and Parker's (1990) and Archer *et al.'s* (1996)—measures appropriate to each are used. In the main they give similar signals.

Tay and Parker's (1990) View of Harmony

The H Index and the I Index The H or Herfindahl index is used in industrial concentration studies and was first proposed as a measure of harmony by van der Tas (1988). For any country, H is the sum over accounting methods of their squared frequencies of use:

$$H = \sum_{i=1}^{n} p_i^2$$

where H = the Herfindahl index,

n = number of alternative accounting methods, and

p_i = the relative frequency of accounting method i.

H has a maximum value of 1 (uniformity) and a minimum value of 1/n (where n accounting methods are adopted in equal proportions, Hermann and Thomas, 1995, p. 256). As less than complete harmony can occur because of different economic circumstances among firms, the following scheme is used here for judging the level of harmony. An H index of 0.75 to 0.89 is regarded as evidence of 'some' harmony and an H index of 0.90 to 0.99 as evidence of 'considerable' harmony. An index of 1.00 is 'complete' harmony, of less than 0.75 'little' harmony.

To measure international harmony, van der Tas (1988) suggested the I index, as an analogue of the H index. The I index is the sum over accounting methods of the product of the relative frequencies of accounting method i in each of n countries:

$$I = \sum_{i=1}^{n} (f_{i1}\, f_{i2} \ldots f_{im})$$

where $f_{i1}, f_{i2}, \ldots f_{im}$ are the relative frequencies of method i in countries 1, 2 . . . m, and n is the number of alternative accounting methods.

Because I tends rapidly to zero if m exceeds two, van der Tas (1988) suggested that the I index be raised to the power 1/(m − 1). The I index thus corrected has been used in many studies.[6] However, it is a flawed construct. Archer and McLeay (1995) have argued that taking the (m − 1)th root of the I index destroys its analogue nature with the H index, because 1/(m – 1) does not equal 2—the exponent in the H index. They suggest that the I index be reformulated as:

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[6] See van der Tas (1988, 1992a), Emenyonu and Adhikara (1998); Emenyonu and Gray (1992, 1996), Hermann and Thomas (1995), Tarca (1998).

$$I = \sum_{i=1}^{n} (f_{i1}\, f_{i2} \ldots f_{im})^{2/m}$$

where

f_{i1} = the relative frequency of accounting method i in country 1,
n = the number of alternative accounting methods, and
m = the number of countries.

Their corrected I index is the sum across accounting methods of the squared geometric means of the relative frequencies of accounting method i in each of m countries. So formulated, it becomes a multi-country analogue of the H index (Morris and Parker, 1998, p. 74).

The Between-Country C Index

For international comparisons, Archer *et al.* (1995), building on a comparability index of van der Tas (1988), suggest the use of a between-country comparability index. Using Archer *et al.'s* (1995) notation, the formula for this index is:

$$\sum_i \sum_j x_{ij}\,(x_{+j} - x_{ij}) \,/\, \sum_i x_{i+}\,(x_{++} - x_{i+})$$

where

i refers to countries,
j to accounting methods,
x_{+j} to accounting method totals,
x_{i+} to country totals, and
x_{++} to the overall total (number of countries by number of accounting methods).

The between-country C index gives the probability that any pair of randomly selected companies, each from a different country, use the same accounting method.

Morris and Parker (1998) show that the between-country C index and the I index are mathematically equivalent for two country comparisons, but diverge when the number of countries exceeds two. Based on a simulation study, they conclude that the between-country C index is the better measure because it reflects more closely than does the I index (with Archer and McLeay's 1995 correction) the underlying distributions of accounting methods across countries. Archer *et al.* (1996) report that, when measuring harmonization, the between-country C index gives signals consistent with their nested linear model approach, discussed next. International comparisons for the current study are reported using the between-country C index, because of its general superiority to the I index. Since the value of the between-country C index is in part a function of the amount of national harmony, the same cut-off points will be used in assessing international harmony as for national harmony.

To illustrate, suppose in matched samples of forty U.K. companies and forty Australian companies, tangible fixed assets are stated at historical cost or are revalued as shown:

	U.K.	Australia	Total
Historical cost	14	3	17
Revalued	26	37	63
Total	40	40	80

The H index for the U.K. is

$$(14/40)^2 + (26/40)^2 = 0.55$$

while the H index for Australia is

$$(3/40)^2 + (37/40)^2 = 0.86$$

indicating little national harmony in the U.K. but some in Australia.
The between-country C index is:

$$[14(17-14) + 3(17-3) + 26(63-26) + 37(63-37)]/$$
$$[40(80-40) + 40(80-40)] = 0.63$$

and indicates little international harmony.

Archer et al.'s (1996) View of Harmony
Archer *et al.* (1996) and McLeay *et al.* (1999) use a series of nested linear models to measure within-country, between-country, inter-temporal and firm-specific effects on accounting policy choices. In any setting, the existence of each effect is measured by whether the additional layer, appropriate to that effect, of the nested models yields significant increases in explanatory power over its predecessor. International harmonization occurs when the distributions of firms across accounting methods in two or more countries become aligned over time. Standardization occurs when the distribution of accounting methods across firms changes over time so that the absolute frequency of one accounting method significantly increases.

The Chi-Square Test
To use Archer *et al.*'s (1996) and McLeay *et al.*'s (1999) methodology, at least two years of data are necessary. We have only one year. Accordingly, we use the chi-square test, which is equivalent to Archer *et al.*'s (1996) static model of harmony (Archer *et al.*, 1996, p. 7, fn 7). The chi-square test was suggested by Tay and Parker (1990) and used by Emenyonu and Gray (1992, 1996) and Hermann and Thomas (1995). This statistic tests observed patterns of use against the null hypothesis of no significant difference across countries in the distributions of companies using accounting alternatives A, B, C, etc. International harmony is indicated when chi-square is not significantly different from zero. In the tangible fixed assets illustration, $\chi_1^2 = 9.04$, which is significantly different from zero at the 1% level, and shows that the distributions of accounting policies are different in the two countries.[7]

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[7] Harmonization has also been measured using multiple discriminant analysis (see Rahman *et al.*, 1996). However, the technique is more suited to measuring de jure or formal, rather than de facto or material, harmonization.

The chi-square test can be unreliable when expected cell frequencies are small. Statistics textbooks usually state that the minimum acceptable expected cell size for the chi-square test is 5. The data in the current study frequently violate that condition. However, combining categories to attain a minimum expected size of 5—the remedy usually suggested—would mean losing some fineness in data and much intrinsically interesting variation across countries. Combining categories can also affect randomness in samples and the inferences that can be drawn from the data (Everitt, 1977, p. 40). In any event, the minimum expected cell size of 5 is actually an arbitrary rule (Cochran 1952, p. 328), and statisticians have suggested other solutions to the problem. Cochran (1954, p. 420), a frequently cited authority, thought that the minimum expected cell size could be 1 if the degrees of freedom were greater than 1 and no more than about 20 per cent of cells had expected frequencies less than 5.[8] For the current study, chi square statistics were computed without combining categories, and then recomputed after combining categories so that Cochran's (1954) rule was satisfied. Whether the two chi-square statistics gave the same accept/reject decision at the 5% significance level for the null hypothesis was then checked. Fisher's exact test was used for 2 × 2 comparisons if Cochran's rule could not be satisfied. The first chi-square (unadjusted) is reported but cases are flagged where the chi square may be unreliable because it conflicted either with the Cochran chi-square or with Fisher's exact test.

Some Practical Problems

A number of practical problems arose in analysing the data:

1. How sensitive are the results to the degree of fineness used in distinguishing one accounting method from another?
2. How should the use of more than one accounting method by the same company be treated?
3. How should the non-disclosure of an accounting method be treated?

Classifying accounting policies is difficult. Here, what were perceived as sensible categories were adopted. However, notably the degree of fineness in classifying accounting policies can influence national and international harmony measures. For example, the classification of foreign exchange translation methods (discussed later in Table 1) distinguishes four separate methods:

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[8] Later research indicates Cochran's rules are too conservative. Let r be the number of rows in a contingency table, c the number of columns, k the number of cells with expected frequency less than 5, and n the sample size. Lewontin and Felsenstein (1965) thought that the conservative minimum expected frequency in 2 × c tables was 1, but also the expected frequency could safely be as low as 0.5. Snedecor and Cochran (1967, p. 235) stated that for 1 × c tables, a minimum expected frequency of 1 was sufficient. Yarnold (1970, p. 865) suggested that where r × c was at least 3, the minimum expected cell size was $5k/(r \times c)$. Roscoe and Byars (1971, p. 759) thought that, where the 5% significance level is used for hypothesis testing, the minimum average expected frequency $n/(r \times c)$ should be at least 2 with data from uniform distributions, 4 with data from moderately skewed distributions, and 6 with data from extremely skewed distributions. Conover (1980, p. 156) stated that the minimum expected cell size could be as small as 1 provided r and c were 'not too small'. Agresti (1990, pp. 246–7) stated that the chi-square statistic is adequate when the minimum average expected frequency $n/(r \times c)$ exceeds 1, and in general the required minimum average falls as r × c increases; however, the chi square statistic becomes unreliable in tables with both small and moderately large expected frequencies. In our study, the average expected frequency always exceeds 1, and usually exceeds Roscoe and Byars' minimum of 6. Therefore, the use of chi-square is done with confidence.

1. Closing (current) rate method (average rate in the profit and loss account), chosen by thirty-two U.K. companies and twenty-three Australian companies.
2. Closing (current) rate method (closing rate in the profit and loss account)—six U.K. companies, two Australian companies.
3. Temporal method—no U.K. companies, two Australian companies.
4. Closing rate method plus temporal method—no U.K. companies, seven Australian companies.

Apparent harmony can be increased by merging methods, for example, by regarding the closing (current) rate approach as one method, irrespective of the rate used to translate the profit and loss account, and the temporal approach as one method irrespective of its coupling with the closing rate approach. Having a large number of separate accounting methods can produce very low between-country C index values, which indicates little international harmony.

Where a company uses more than one accounting method, the combination has been treated as one method, as illustrated by the case of foreign exchange translation.

Where accounting policies are not fully disclosed by all companies, the data have a 'not-disclosed' category. Careful reading of the full annual report, and in many cases direct communication with the company, reduced the number of non-disclosures. Of the eleven accounting policies looked at, there were no non-disclosures in three (valuation of tangible fixed assets, depreciation of tangible fixed assets, deferred taxation liabilities). There were relatively few non-disclosures in four policies (inventory valuation, goodwill on consolidation, foreign exchange translation, depreciation method). This leaves only four policies (research and development costs, interest on construction, other identifiable intangibles, finance leases) where the number of non-disclosures was large and their impact rather uncertain.

Archer and McLeay (1995) and Archer *et al.* (1995, 1996) suggest three alternative ways to handle non-disclosures: they can be omitted from all statistical analyses, treated as not applicable, or treated as if the item exists but the method is not disclosed.[9] Their suggestions are in the context of the C index. Treating non-disclosures as not applicable means that, for the item in question, each non-disclosing company is comparable with all other non-disclosers and with every disclosing company. Consequently, the numerator and denominator of the C index are increased to allow for the impact of non-disclosures, giving a disclosure-adjusted comparability index. In contrast, if the item exists but the method is not disclosed, the C index denominator, but not the numerator, is increased to allow for non-disclosures, giving a raw comparability index. The disclosure-adjusted C index will usually produce higher scores, and the raw C index always lower scores, than the C index which omits non-disclosures entirely. Morris and Parker (1998) present formulae for, and simulations of, disclosure-adjusted and raw versions of the between-country C index (and an extension to the H and I indices).

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[9] They also state that sometimes a 'default' assumption may be made whereby non-disclosers can be assumed, from the surrounding circumstances, to use a particular method, such as one required by an accounting standard. In that case, non-disclosers can simply be added to companies disclosing that they do use the method. In their statistical model, Archer *et al.* (1996, p. 13) alternately treat non-disclosures as equivalent to an additional accounting method or ignore them.

To illustrate Archer and McLeay's (1995) and Archer *et al.*'s (1995, 1996) rules, suppose that, in the fixed asset valuation example, non-disclosers are U.K. 5, and Australia 10. The matrix will now be:

	U.K.	Australia	Total
Historical cost	14	3	17
Revalued	26	37	63
Not disclosed	5	10	15
	45	50	95
H Index			
Disclosure adjusted	0.64	0.91	
Unadjusted	0.55	0.86	
Raw	0.43	0.55	
Between-country C index			
Disclosure adjusted	0.78		
Unadjusted	0.63		
Raw	0.45		

Disclosure-adjusted and raw indices are based on formulae in Morris and Parker (1998, p. 81); the unadjusted indices ignore non-disclosures. In each case, the disclosure-adjusted index values exceed the unadjusted index values, which in turn exceed the raw index values. The effect of non-disclosures increases with their relative frequency—for example, the gap between disclosure-adjusted and raw H indexes is greater for Australia, because it has the larger proportion of non-disclosers.

Deciding how to handle non-disclosures depends on the underlying facts. Using unadjusted indices, that is, ignoring non-disclosures, would be reasonable if non-disclosures were infrequent. Disclosure-adjusted indices should be used if it is known that non-disclosers are 'not applicable' because these companies had no fixed assets. Raw indices should be used if the non-disclosers are known to have fixed assets but have not disclosed the accounting method.

RESULTS

Analysis of Accounting Policies

Table 1 summarizes the data for each accounting policy.

Valuation of tangible fixed assets. There was some national harmony in Australia but little harmony in the U.K. There was little international harmony as shown by the low between-country C index value and the significant chi-square.

Depreciation of tangible fixed assets. There was complete national harmony in Australia but little national harmony in the U.K. About one-third of British

Table 1

RESULTS: INDIVIDUAL ACCOUNTING POLICIES

	U.K.	Australia	Total	Between-country C index	χ^2	d.f.
Valuation of tangible fixed assets						
Historical Cost	14	3	17			
Current cost	1	0	1			
Revaluation	25	37	62			
	40	40	80	0.60	10.44*	2
H	0.51	0.86				
Depreciation of tangible fixed assets						
All tangible assets (except freehold land and investment properties) depreciated	27	40	67			
Some land and buildings not depreciated	13	0	13			
	40	40	80	0.68	15.52*	1
H	0.56	1.00				
Inventory valuation						
Lower of cost and net realizable value	40	40	80	1.00	0	1
H	1.00	1.00				
Research and development costs						
Written off to P&L a/c	24	17	41			
Both capitalized and written off	1	15	16			
	25	32	57			
Not disclosed	15	8	23			
	40	40	80	discl. adj. 0.76 unadj. 0.53 raw 0.26	12.79*	1
H—Discl. adj.	0.97	0.68				
—Unadj.	0.92	0.50				
—Raw	0.36	0.32				
Goodwill on consolidation						
Written off to reserves	37	0	37			
Amortized	1	33	34			
Written off and amortized	1	0	1			
	39	33	72			
Not disclosed	1	7	8			
	40	40	80	discl. adj. 0.22 unadj. 0.03 raw 0.02	68.12*	2
H—Discl. adj.	0.91	1.00				
—Unadj.	0.90	1.00				
—Raw	0.86	0.68				
Foreign exchange translation of subsidiaries						
Closing (current) rate method (average rate in P&L)	32	23	55			
Closing (current) rate method (closing rate in P&L)	6	2	8			
Temporal method	0	2	2			

TABLE 1 (Continued)

	U.K.	Australia	Total	Between-country C index	χ^2	d.f.
Closing (current) rate method plus temporal method	0	7	7			
	38	34	72			
Not disclosed	2	6	8			
	40	40	80	discl. adj. 0.66	12.29*	3
				unadj. 0.58		
				raw 0.47		
H—Discl. adj.	0.76	0.64				
—Unadj.	0.73	0.51				
—Raw	0.66	0.37				
Interest on construction						
Capitalized	18	15	33			
Not capitalized	3	6	9			
	21	21	42			
Not disclosed	19	19	38			
	40	40	80	discl. adj. 0.90	1.27	1
				unadj. 0.65		
				raw 0.18		
H—Discl. adj.	0.93	0.89				
—Unadj.	0.76	0.59				
—Raw	0.21	0.16				
Other identifiable intangibles						
Written off to reserves	4	0	4			
Capitalized and amortized	3	19	22			
Capitalized and not amortized	6	14	20			
	13	33	46			
Not disclosed	27	7	34			
	40	40	80	discl. adj. 0.82	12.51*	2
				unadj. 0.33		
				raw 0.09		
H—Discl. adj.	0.93	0.67				
—Unadj.	0.36	0.51				
—Raw	0.04	0.35				
Finance leases						
Capitalized	31	33	64			
Not capitalized	1	0	1			
	32	33	65			
Not disclosed	8	7	15			
	40	40	80	discl. adj. 0.98	1.06	1
				unadj. 0.97		
				raw 0.64		
H—Discl. adj.	0.96	1.00				
—Unadj.	0.94	1.00				
—Raw	0.60	0.68				
Deferred taxation liabilities						
Full provision, liability method	2	40	42			
Partial provision, liability method	38	0	38			
	40	40	80	.05	72.38*	1
H	0.91	1.00				

TABLE 1 (Continued)

	U.K.	Australia	Total	Between-country C index	χ^2	d.f.
Depreciation method						
Mainly straight line	33	24	57			
Mainly reducing balance	0	1	1			
Both straight line and reducing balance	4	10	14			
Other	3	4	7			
	40	39	79			
Not disclosed	0	1	1			
	40	40	80	discl. adj. 0.55 unadj. 0.54 raw 0.53	5.14[a]	3
H—Discl. adj.	0.70	0.48				
—Unadj.	0.70	0.46				
—Raw	0.70	0.43				

* Significant at 5% level.

[a] May not be reliable.

Discl. adj. = disclosure-adjusted index—assumes non-disclosures are of items not applicable to firms.

Unadj. = index ignores non-disclosures.

Raw = raw index—assumes non disclosures are of items relevant to firms.

companies did not depreciate buildings in 1993. None of them depreciated investment properties and freehold land. Two Australian retail companies (Coles Myer and Foodland) did not depreciate investment properties. There was little international harmony between the U.K. and Australia, as indicated by the between-country C index and chi-square.

Inventory valuation. The lower of cost and net realizable value was the predominant practice and there was complete national harmony in both the U.K. and Australia. There was therefore also complete international harmony as indicated by the between-country C index and chi-square.

Research and development costs. Not all large companies have a research and development function so there were many non-disclosures. Their treatment influences the extent of national and international harmony for this item. If non-disclosures are 'not applicable' (i.e., if the disclosure adjusted indices are used), there was considerable national harmony in the U.K., little in Australia, and some international harmony. If non-disclosures are treated as 'existing but not disclosed' (i.e., if the raw indices are used), the H and between-country C indices indicate little national or international harmony. Similarly, the chi-square tests show little international harmony although these ignore non-disclosures.

Goodwill on consolidation. There was complete or considerable national harmony in both countries but little international harmony between the U.K. and Australia. This reflects the fact that whereas the capitalization and amortization of goodwill on consolidation was the predominant practice in Australia, in the U.K. almost all companies wrote it off against reserves. These conclusions are minimally altered if the indices are adjusted for non-disclosures.

Foreign exchange translation. Subject to the comments above about fineness of classification, there was little national harmony in either country. There was little international harmony according to the between-country C index. Nor does the chi-square statistic indicate international harmony. If the indices are adjusted upwards for non-disclosures there was some national harmony in the U.K. In both countries there was a preference for the closing (current) rate of foreign exchange translation, with most companies using average rather than closing rates in the profit and loss account. U.K. companies did not use the temporal method. The temporal method was, however, used in Australia, sometimes in conjunction with the closing rate method. This may be the result of different interpretations of similar rules rather than a lack in the U.K., compared with Australia, of subsidiaries 'integrated' with their parents.

Interest on construction. The extent of national and international harmony depends on the treatment of non-disclosures. If these are 'not applicable' (i.e., if the disclosure adjusted indices are used), there was considerable national harmony in the U.K., some harmony in Australia, and considerable international harmony between the U.K. and Australia as measured by the between-country C index. If non-disclosures are treated as 'existing but not disclosed' (i.e., if the raw indices are used), there was little national or international harmony. A similar finding emerges from the unadjusted indices, although there was some national harmony in the U.K. The chi square test, which ignores non-disclosures, indicates harmony across both countries, so that it and the between-country C index conflict.

Other identifiable intangibles. Other identifiable intangibles in general exhibited little national or international harmony under H or between-country C indices, with and without adjustment for non-disclosures, and are consistent with the chi-square test. The high disclosure adjusted H index for the U.K. and disclosure adjusted between-country C index are the result of the very high degree of non-disclosure (over two-thirds) by U.K. companies.

Finance leases. The extent of harmony depends on the treatment of non-disclosures. If the disclosure-adjusted indices are used, there was considerable or complete national harmony within each country, and considerable international harmony. A similar picture emerges if non-disclosures are ignored. However, if the raw indices are used, there was little national or international harmony using the index measures. The chi-square and Fisher exact tests reinforce the results for the index measures that ignore non-disclosures or treat them as 'not applicable'. U.K. and Australian accounting standards require the capitalization of finance leases. With one exception, all the U.K. companies which disclosed finance leases capitalized them. The exception was Unilever which stated (our italics) that lease rental payments 'which are *principally* in respect of operating leases, are charged to profit and loss account'. It is highly probable that the non-disclosing U.K. and Australian companies did not have finance leases, and that therefore the raw indices can be ignored.

Deferred taxation liabilities. There was considerable national harmony in both countries, but there is little harmony between the U.K. and Australia. All the Australian companies chose full provision plus the liability method whereas all but two of the U.K. companies chose partial provision and the liability method. The companies that practised full provision instead were the Anglo-Dutch multinationals Shell and Unilever.

Depreciation Method. There was little national harmony in either country. The between-country C index, but not the chi-square, indicates little international harmony. Straight line depreciation was more common than reducing balance in both countries. These results are influenced by classifying as a separate category fourteen firms that used both methods. Merging these firms with those that used straight line only would increase the level of harmony.

The above results show little international harmony between the U.K. and Australia using the between-country C index and the chi-square test. Even with disclosure-adjusted indices there was considerable international harmony on only three policies (inventory valuation, interest on construction, finance leases), some harmony on two policies (identifiable intangibles, research and development) and little harmony on six policies (valuation of tangible fixed assets, depreciation of tangible fixed assets, goodwill on consolidation, foreign exchange translation, deferred taxation liabilities, depreciation method).

U.S. GAAP as an Intervening Factor

Tables 2, 3, 4 and 5 rearrange these results in the light of our hypotheses regarding the influence of U.S. GAAP.

Table 2 shows, for each accounting policy, the number of companies in the U.K. and Australia that either did or did not conform to U.S. GAAP (ignoring non-disclosures). One country is more in conformity with U.S. GAAP if its relative frequency of companies complying with U.S. GAAP significantly exceeds that of the other country. The table suggests that large companies in both countries were either broadly or completely in conformity with U.S. GAAP on five policies: inventory valuation, foreign exchange translation of subsidiaries, interest on construction,

Table 2

BROAD CONFORMITY WITH U.S. GAAP

Accounting policy	U.K.		Australia		χ^2
	Yes	No	Yes	No	
Valuation of tangible fixed assets	14	26	3	37	9.04*
Depreciation of tangible fixed assets	27	13	40	0	15.52*
Inventory valuation	40	0	40	0	0
Research and development costs	24	1	17	15	12.79*
Goodwill on consolidation	1	38	33	0	68.12*
Foreign exchange translation of subsidiaries	32	6	32	2	1.79
Interest on construction	18	3	15	6	1.27
Other identifiable intangibles	3	10	19	14	4.46*
Finance leases	31	1	33	0	1.06
Deferred taxation liabilities	2	38	40	0	72.38*
Depreciation method	40	0	40	0	0

* Significant at 5% level.

finance leases, and depreciation method. However, on the other six policies, large U.K. and Australian companies differed significantly on compliance with U.S. GAAP, as shown by the chi-square statistics. Australian companies were more in conformity with U.S. GAAP on four policies: depreciation of tangible fixed assets, goodwill on consolidation, other identifiable intangible assets, and deferred taxation liabilities. U.K. companies were more in conformity with U.S. GAAP on two policies: valuation of tangible fixed assets and research and development costs. Overall, Australian companies were in conformity with U.S. GAAP on more accounting policies than were U.K. companies.

Then examined was whether the level of international harmony was higher when both countries conformed to U.S. GAAP, and lower when only one or neither did. Table 3 ranks the eleven policies in descending order of the between-country C index. Here, broad conformity with U.S. GAAP is defined as any case where at least two-thirds of a country's sample broadly conformed to U.S. GAAP. Both U.K. and Australian companies did so for the first three policies (inventory valuation, finance leases, interest on construction) and the sixth, seventh and ninth policies (depreciation of tangible fixed assets, foreign exchange translation, depreciation method). For the other five policies, one or none of the two sets of companies complied with U.S. GAAP. The probability of observing the foregoing pattern by chance is 0.089 (Mann-Whitney U test) which is not significant at conventional levels. However, foreign exchange translation and depreciation method are the only policies in our study in which U.S. GAAP allows some choice. Conformity with U.S. GAAP for foreign exchange translation and depreciation method will not promote harmony in the way that conformity with U.S. GAAP might for other policies. Omitting the two policies produces a significant result (Mann-Whitney probability = .028). Therefore, international harmony between U.K. and Australian companies is higher when both countries broadly conform to U.S. GAAP and lower when only one or neither of them does.

The above result depends on how 'broad conformity with U.S. GAAP' is defined. If the term is taken to mean a simple majority of companies in a country, then the between-country C index finding is strengthened; if a three-quarters majority, the finding is not statistically significant. On the other hand, if foreign exchange translation and depreciation method are omitted, the finding is significant for all three definitions of 'broad conformity with U.S. GAAP'. A two-thirds majority is thought to be a reasonable middle path for presentation purposes.

Ignoring depreciation method and foreign exchange translation, the chi-squares in Table 3 (taken from Table 1) show that there is harmony for the first three policies but not the others. The chi-squares also show international disharmony in all cases where one or neither country conforms to U.S. GAAP, but only in one case, depreciation of tangible fixed assets, where both countries conform to U.S. GAAP. The finding is consistent with that for the between-country C index.

The two accounting policies where U.K. and Australian companies were furthest apart were goodwill and deferred tax. Both are cases where U.K. GAAP, but not

TABLE 3

ACCOUNTING POLICIES: NATIONAL VS. INTERNATIONAL HARMONY

Accounting policy	Between-country C index	H indexes			Broad conformity with U.S. GAAP
		U.K.	Australia	$\chi 2$	
	Considerable international harmony				
Inventory valuation	1.00	1.00	1.00	0	U.K. and Australia
Finance leases	0.98	0.96	1.00	1.06	U.K. and Australia
Interest on construction	0.90	0.93	0.89	1.27	U.K. and Australia
	Some international harmony				
Other identifiable intangibles	0.82	0.93	0.67	12.51*	Neither
Research and development	0.76	0.97	0.68	12.79*	U.K.
	Little international harmony				
Depreciation of tangible fixed assets	0.68	0.56	1.00	15.52*	U.K. and Australia
Foreign exchange translation	0.66	0.76	0.64	12.29*	U.K. and Australia
Valuation of tangible fixed assets	0.60	0.51	0.86	10.44*	Neither
Depreciation method	0.55	0.70	0.48	5.14	U.K. and Australia
Goodwill	0.22	0.91	1.00	68.12*	Australia
Deferred tax	0.05	0.91	1.00	72.38*	Australia

* Significant at 5% level.
Broad Conformity with U.S. GAAP = at least a two-thirds majority of companies in the country conform with U.S. GAAP.

Australian GAAP, differed substantially from U.S. GAAP. On deferred tax the Australian standard, like the U.S., requires full provision whereas the U.K. standard requires partial provision. (The two companies not complying with the U.K. standard were the Anglo-Dutch multinationals Shell and Unilever.) On goodwill, the U.K. standard in 1993 was more permissive: U.K. companies, unlike Australian and U.S. companies, had the option to amortize goodwill or to write if off immediately to reserves. No U.K. company chose to amortize except Unilever.

Table 4

IMPACT OF INTERACTION BETWEEN U.S. GAAP AND AUSTRALIAN/ U.K. STANDARDS ON BROAD CONFORMITY WITH U.S. GAAP

	Standard aligned with U.S. GAAP	Standard not aligned with U.S. GAAP	No standard
Panel A: Australia			
Sample companies broadly conform to U.S. GAAP	7	0	1
Do not broadly conform	0	2	1
		$\chi^2_2 = 8.44$*	
Panel B: U.K.			
Sample companies broadly conform to U.S. GAAP	5	1	1
Do not broadly conform	0	3	1
		$\chi^2_2 = 5.62$	

Broad Conformity with U.S. GAAP = at least a two-thirds majority of companies in the country conform with U.S. GAAP.
* Significant at 5% level.

The results in Tables 2 and 3 can be reinforced by considering the interaction between U.S. GAAP and Australian or U.K. standards on broad conformity of practice with U.S. GAAP. Where Australian or U.K. standards are aligned with U.S. GAAP, practice should exhibit more conformity with U.S. GAAP and, if our hypothesis is correct, the tendency should be greater in Australia. Table 4 shows the results of this analysis, Panel A for Australia, Panel B for the U.K. Again, broad conformity with U.S. GAAP means at least a two-thirds majority of sample companies complying with U.S. GAAP.

In all seven cases where Australian standards were aligned with U.S. GAAP, the Australian sample broadly conformed with U.S. GAAP; in the two cases (valuation of fixed assets, research and development) where standards did not align with U.S. GAAP practice did not broadly conform with U.S. GAAP. In the two cases where there were no Australian standards (interest on construction, identifiable intangibles) practice broadly conformed with U.S. GAAP in one but not both. The pattern in Panel A is statistically significant and is consistent with our hypothesis.

In all cases where U.K. standards were aligned with U.S. GAAP the U.K. sample broadly conformed with U.S. GAAP. Where the U.K. standard conflicted with U.S. GAAP, practice tends not to comply with U.S. GAAP, and broadly conforms with U.S. GAAP on one issue but not both where there were no U.K. standards. Unlike Panel A, the pattern in Panel B is not statistically significant, and this is also consistent with our hypothesis.

TABLE 5

IMPACT OF U.S. LISTING ON BROAD CONFORMITY WITH U.S. GAAP

Accounting policy	U.K.					Australia				
	U.S. listed		Not U.S. listed			U.S. listed		Not U.S. listed		
	Yes	No	Yes	No	χ^2	Yes	No	Yes	No	χ^2
Valuation of tangible fixed assets	9	8	5	18	4.18*	0	7	3	30	0.7
Depreciation of tangible fixed assets	15	2	12	11	5.81*	7	0	33	0	0
Inventory valuation	17	0	23	0	0	7	0	33	0	0
Research and development costs	13	0	11	1	1.13	3	3	14	12	0.03
Goodwill on consolidation	1	15	0	23	1.48	7	0	26	0	0
Foreign exchange translation of subsidiaries	16	1	16	5	2.26	7	0	25	2	0.55
Interest on construction	7	1	11	2	0.03	6	1	9	5	1.05
Other identifiable intangibles	1	6	2	4	0.67	4	3	15	11	0.001
Finance leases	13	1	18	0	1.31	6	0	27	0	0
Deferred taxation liabilities	2	15	0	23	2.85	7	0	33	0	0
Depreciation method	17	0	23	0	0	7	0	33	0	0

* Significant at 5% level.

In Panels A and B, similar patterns and statistical significance to those reported are found if broad conformity with U.S. GAAP means at least a simple majority, a three-quarters majority, or full compliance.[10] The results are also unchanged if depreciation method and foreign exchange translation, where U.S. GAAP is more flexible, are omitted from Table 4. As mentioned, in each case of conformity, the U.K. or Australian standard was issued after the U.S. standard and in many cases it is possible to see a transfer of ideas in the standards between the U.S. and the other countries. In short, there appears to be an interaction effect between U.S. GAAP and Australian or U.K. standards, but the effect is marginally stronger in Australia.

It was hypothesized that the influence of U.S. GAAP in Australia would not be restricted to those Australian companies listed in the U.S. Table 5 decomposes

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[10] All chi square tests were compared with the Fisher exact test, the latter conducted after collapsing the not aligned and no standard columns. Results for Panel A are the same under both tests for all definitions of 'broad conformity with U.S. GAAP'. For Panel B both tests give the same results where 'broad conformity with U.S. GAAP' means at least a three-quarter majority or full compliance, but conflict where broad conformity means either a simple majority or a two-thirds majority. On balance, the chi square test is believed by the authors to be more informative as it does not result in any loss of information from aggregating categories.

Table 2 into firms which were/were not listed in the U.S. Inspection of this table suggests that U.K. companies listed in the U.S. were more likely to conform broadly with U.S. GAAP in the case of valuation of tangible fixed assets and depreciation of tangible fixed assets, but on other policies were no more likely to conform with U.S. GAAP than were U.K. companies not listed in the U.S. On all policies U.S.-listed Australian companies were no more likely to conform with U.S. GAAP than their non-U.S.-listed counterparts. These results suggest that U.S.-listing status had a limited effect on conformity with U.S. GAAP for both samples. Therefore, the greater tendency of large Australian companies in general to follow U.S. GAAP than do large U.K. companies, in Tables 2, 3 and 4 appears to be an intervening factor reducing the degree of international harmony between large U.K. and Australian companies. U.S.-listing status does not have a similar impact.

CONCLUSIONS

The hypothesis was that U.S. GAAP could act as an impediment to international harmony of accounting measurement policies in other countries by creating a situation of partial harmony in which some but not all countries harmonized with U.S. GAAP. This idea was tested by examining eleven accounting measurement policies of forty matched pairs of large companies from Australia and the U.K. using data from 1993 annual reports. The hypothesis was that, despite the traditional links between the two countries, U.S. GAAP would have a greater influence on Australian than on U.K. practices at the time, because of the increasing U.S. influence on Australian accounting standards, its accounting profession and increasing direct U.S. investment in Australia. The companies sampled display little international harmony on most accounting policies studied, although they do display considerable or complete *national* harmony on some policies (seven for the U.K. and five for Australia). Australian companies appear to conform more to U.S. GAAP than do U.K. companies. U.K./Australian international harmony is higher when both countries conform to U.S. GAAP, and lower when only one or neither does; while U.S.-listing status seems to have no influence.

The conformity of Australian companies with U.S. GAAP is an example of partial harmonization, which hinders international comparability of accounts and may cause problems for regulators seeking to improve harmonization internationally. The finding may be of interest to national standard setters trying to impose new standards that do not conform to U.S. GAAP.

Although differing levels of conformity with U.S. GAAP is a plausible reason for the lack of international harmony between the U.K. and Australia, it is not a complete explanation. More research, perhaps by examining changes in international harmony across time, is necessary to further explore why these countries, despite their strong historical links, now differ in terms of international harmony of accounting policy measures. Further insight could be obtained by comparing the U.K. and Australian companies individually with large U.S. companies, or U.K. companies with companies in other countries (such as France) whose large companies are known to be influenced by U.S. GAAP. Also, U.K. practices may have moved away from Australian practices because of EU harmonization, as could be shown by comparing U.K. practice with that of other EU countries.

Since 1996, Australia has had a program of harmonizing its accounting standards with those of the IASC (Parker and Porter 2000, p. 39). The revised IASs endorsed by IOSCO in May 2000 have brought IAS GAAP and U.S. GAAP closer together but some differences still remain between the two GAAPs. Therefore, the impact of the Australian/IASC harmonization program on broad conformity with U.S. GAAP among Australian companies is uncertain and requires investigation.

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DEREK MATTHEWS

The Influence of the Accountant on British Business Performance From the Late Nineteenth Century to the Present Day

Britain has more professionally qualified accountants per capita than any of her leading economic rivals and they play a major role as advisers to British companies and take a disproportionate share of the jobs in top management. Unfortunately for the accountants, business historians, other academics, commentators and even contemporary politicians have almost universally noted this to be a bad thing. This article discusses whether this reputation is justified by assessing the past performance of professional accountants as business advisers and managers. Stereotypical criticisms of accountants in terms of excessive caution, their support for the holding company form, or seeing problems in narrow financial terms are found to be unjustified. The promotion of accountants to the top jobs can be seen as rational profit-maximizing behaviour by British companies and a recent survey has demonstrated the performance of accountants in top management in recent years to be superior to other professions such as engineers.

Key words: Accountancy; Business history; Great Britain; Management.

Today top management in Britain has an internationally unique feature—the prominent role played by the professional accountant. In previous work, colleagues and I have argued that Britain has proportionately more accountants than other countries because of the particular nature of her capital market historically, which set up a demand for the independent auditing of company accounts (Matthews *et al.*, 1997, 1998). As the number of companies grew through the twentieth century so did the number of accountants, particularly of the elite chartered accountants. Increasingly these accountants left their professional practices and went to work for companies and indeed rose in disproportionate numbers to the top in management. Whereas in 1911 less than 2 per cent of the managing directors and chairmen of a sample of quoted companies were qualified accountants, by 1991 the figure was over 20 per cent (Matthews *et al.*, 1998, p. 125).

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We have argued (Matthews *et al.*, 1997, p. 425) that the reason for the accountants' success was that, almost by accident, their audit-based training and subsequent experience gave them a preparation for general management unrivalled in the British context, and certainly not bettered by the training engineers received (Matthews, 1999). The auditor had the right by law, for example, to be privy to the innermost secrets of their clients, who in turn could range from the smallest corner shop to multinational companies, and be found in all sectors of the economy from banks to steel works. Moreover, accountants have hitherto been seen merely as financial functionaries whereas their role has always been broader than that; for example, they frequently managed companies in receivership, while the auditor was always part management consultant (see Matthews, 1998). To some extent in consequence of the misapprehension of the accountants' role, their prominent position in British management has usually not been viewed with approval either by business historians, journalists, contemporary management theorists or even politicians (Erickson, 1959, p. 74; Sampson, 1965, p. 525; Alford, 1976, p. 61; Armstrong, 1985, p. 129; Handy *et al.*, 1987, p. 12; Heseltine, 1993, p. 8). Incidentally, the condemnation of accountants stretches across the Atlantic where, for example, Johnson and Kaplan (1987) have handed a fair share of the blame for any shortcomings in the 1980s and early 1990s American economy to the influence of their cost accountants, burdened as they were with financial accounting requirements.

This issue is of considerable significance, of course, since historians, economists and many other commentators have hotly debated the role of British management and entrepreneurship as an explanation of Britain's relative economic decline. Writers like Locke (1984) have gone so far as to attribute most of Britain's problems to the poor training of her managers. However, others like McCloskey (1971), in the neoclassical economic history camp, downplay the importance of the entrepreneur and point to more fundamental factors in Britain's apparent economic decline, such as the relative distribution of resources. Clearly, since accountants have been so prominent in British management their performance is a key indicator in this debate, and this article discusses whether the poor reputation of accountants is justified.

In assessing the impact of accountants it is important to differentiate three aspects of their role in the management of companies. First, there are the tools of their trade: the drawing up, presentation and auditing of companies' accounts both for internal and external consumption. Second, there is the quality of advice accountants give management; and third, there is the performance of accountants as managers themselves. In this article, although there is a brief discussion of the first of these roles, the focus is mainly on the latter two aspects of the accountant's work and these are assessed by marshalling the historical evidence mainly from secondary sources and discussing the stereotypical criticisms of accountants in terms of: seeing problems in narrow financial terms and consequently neglecting technology, their support for the holding company form, and an excessive caution and an unwillingness to take risks. Finally, whether accountants in fact made superior managers is discussed, and some recent new evidence, which compared the performance of accountants at the head of British companies and those with other backgrounds, is presented.

THE TOOLS OF THE TRADE

The most difficult of the three roles of the British accountant to assess is the impact of the way the financial numbers are presented. The ability of published accounts to distort the capital market, or the extent to which the way assets are valued or profits calculated might lead to wrong investment decisions is a fascinating subject which we cannot do justice to here (see, e.g., Edwards and Boyns, 1991). A number of brief points can be made in this regard, however, since of all the accountant's activities in the last hundred years this is the one most open to criticism. It is often argued that the quality of company accounts historically were (and still are) deficient, and business historians have been warned a number of times about their use as a source of data (see, e.g., Marriner, 1980; Parker, 1991). A witness to the Parliamentary Committee on Company Law in 1928 described balance sheets as 'models of obscurity'; while the chartered accountant, Mark Webster Jenkinson, in his 1928 book, *The Value of a Balance Sheet*, stated that the 'backers of horses have better information available than speculators in shares' (quoted in Robb, 1992, p. 127). For this the accountants must bear a major share of the responsibility.

Notwithstanding Arnold's (1991) recent attempt to restore confidence in late-nineteenth-century accounts, there is little doubt of their fallibility in the twentieth century. Company accounts were deficient in a number of well-known regards. First, they could be deliberately misleading. The so-called 'window dressing' of accounts (most prominently the devious movement of assets in and out of companies, especially banks, around financial year end to give a false boost to the value of the company) has been endemic and accepted by auditors throughout the history of joint stock enterprises in Britain (Howitt, 1966, pp. 72–3; Kitchen, 1985, p. 72). Second, less downright deceptive was the practice of restricting the information carried by the accounts by pooling huge sums under general headings. For example, at one extreme the balance sheet of the shipping line, P. & O., in the 1920s condensed all assets into one total (Napier, 1991, p. 308). A third related weakness, which arose out of the growth of the holding company form, was the lack of information on subsidiaries (Kitchen, 1979, p. 103). Proponents of consolidated statements would argue that, ideally, there is a full consolidation of the accounts of all subsidiaries, a practice common in the U.S.A. since before the First World War. Yet, whilst 270 of 414 British company accounts examined by *The Economist* in 1932 indicated substantial subsidiary interests, only 58 made clear that their profits took fully into account the profits or losses of their subsidiaries (quoted in Aranya, 1970, p. 252). A fourth weakness was that of profit smoothing by, for example, a change of policy regarding depreciation allowances or the use of hidden reserves (Edwards, 1989, p. 122). Companies now known to have held large secret reserves in the interwar period include Boots, Armstrong Whitworth, BAT, Imperial

Tobacco, J. Lyons, G. K. N., Distillers, P. & O. and John Summers (Chapman, 1974, pp. 135–6; Lee, 1979, p. 22; Edwards, 1989, p. 140; Cox and Smith, 1990; Napier, 1991, p. 31). Indeed, when the chairman in the infamous Royal Mail case went to prison for, in effect, the deceptive use of hidden reserves (the company's auditor from Price Waterhouse was tried but acquitted) *The Economist* had said that if he was guilty 'most of the chairmen of large companies would today be in custody' (Green and Moss, 1982, pp. 142–3).

Almost without exception, all these manoeuvrings within the companies' accounts received a clean audit certificate. Indeed, very often the auditors helped make up the accounts or devise the 'window dressing', as well as lending the accounts their final imprimatur. Moreover, although it was one of its prime functions, the auditing procedure has also proved little guard against the most outrageous frauds. Auditors, of course, have uncovered frauds but many major defalcations have caught them out. These have ranged from the notorious cases of the London and Globe Finance Corporation at the turn of the century, the City Equitable Insurance Company, which collapsed in 1922, through the machinations of Charles Hatry in the 1920s, the collapse of the Rolls Razor company in 1964, and the London and Counties Securities Group in the early 1970s, down to the infamous scandals like BCCI, Maxwell, Barings Bank and the many others of the late 1980s and early 1990s (*The Accountant*, 15 May 1909, p. 693; *Accountancy*, March 1976, p. 3; Manley, 1976, pp. 107–15; Fanning, 1985, pp. 110–14; Kochan and Whittington, 1991; Bower, 1995; Gapper and Denton, 1997).

Although they had pioneered the art of auditing in the nineteenth century, by the twentieth century in most aspects of company financial reporting, particularly regarding the level of disclosure, the British lagged behind the Americans (Edwards, 1979). So too with cost or management accounting. Recent work by Boyns and Edwards has shown that the British were not backward in terms simply of estimating their costs (Edwards *et al.*, 1995; Edwards and Boyns, 1997). While firms of any size by the late nineteenth century conducted some costing exercises, their level of sophistication and usefulness to management decision making was probably limited. In regard to the use of more sophisticated costing techniques the British perhaps also lagged behind the Americans. The latter pioneered, for example, the use of standard costing prior to the First World War and it was said to be in use by most U.S. firms by 1950 (Solomons, 1968, pp. 44, 46–7; Parker, 1969, p. 22; Locke, 1984, p. 92; Boyns, 1998, p. 51; Fleischman and Tyson, 1998, pp. 107–8). In Britain the technique was probably not the rule by 1960. Again with regard to investment appraisal, Parker notes that it was only in the 1960s that discounted cash flow techniques became widespread (Parker, 1969, pp. 56–7; Banyard, 1985, p. 50; Millar, 1991, p. 758).

Within this general picture of British backwardness in accounting techniques, however, it must be said that the progressive elements within the accounting profession were a force for change. De Paula, for example, 'blazed a new trail' in the accounts of Dunlop as financial controller (Edwards, 1979, p. 296). Starting in 1929, the Dunlop accounts included vastly more detail and full consolidation. Even so, these changes were apparently largely based on American practice and literature.

In one regard the generality of auditing pushed companies in the right direction by encouraging setting aside provision for depreciation. In a small sample of company reports for ten-year periods from 1881 down to the 1950s, of those accounts qualified by their auditors, for between a quarter and a half the reason given was a lack of depreciation provision.[1] But although accountants might try to nudge companies to improve their practices, legally, of course, the directors were responsible for the accounts and, although auditors and accountants could hold out on matters of principle, they could be and often were overruled by the board. Garnsey doubtless expressed the accountant's common viewpoint when he wrote in 1931 that 'the real opposition to any but the most essential changes in the form of the published accounts often comes from boards of directors who are not all imbued with the desire to give shareholders as much information as possible' (quoted in Edwards, 1984, p. 17). Early commercial pressures on the auditor by management not to insist on depreciation, for example, were stated by an ICAEW council member in 1893: 'Auditors and especially those who have to deal with joint-stock or other concerns where the remuneration of the management is made wholly or partly dependent upon declared Profits, know in what varied forms resistance to an adequate Charge against profits for Depreciation is presented' (Parker, 1986, p. 57). On balance, the impression given by the literature is that auditors deferred to strong-willed management (Jones, 1981, p. 117; Robb, 1992, p. 156). There are very few examples of an auditor prepared to challenge the largest companies on matters of principle as, for example, Sir William McLintock, did regarding ICI in 1931 (Reader, 1975, p. 158).

Nonetheless best practice in company accounts was usually established, if only where not strongly opposed by management, by the accountants themselves, perhaps under pressure from market forces, and only later enshrined in legislation. For example, consolidation accounting increased in the 1930s, and was prescribed for new listed companies in 1939 by the Stock Exchange, prior to becoming compulsory with the Companies Act of 1948 (Stacey, 1954, p. 223; Edwards, 1989, p. 244). The professional regulatory body, the ICAEW, published their 'Recommendations on Accounting Principles' between 1942 and 1969, but these too merely codified best practice. This was in contrast to the American Institute of Certified Public Accountants who were more prepared to initiate change (Aranya, 1970, p. 287). The recommendations gave way to more prescriptive accounting and auditing standards from the 1970s and the Companies Acts became more demanding. But in both regards self-regulation was maintained, and the accounting societies and the legislature continued to follow rather than lead the best practice established by the companies themselves, driven by the demands for information by the burgeoning capital market (Wilson, 1995, p. 188). Yet, although company reports and accounts became vastly more detailed in the postwar decades this was not always matched by clarity and reliability. The 'window dressing' shenanigans of the nineteenth century have developed down to the present day into the fine art of 'creative accounting', which has been both authored by chartered accountants as finance directors and condoned by them as auditors (Griffiths, 1985; Smith, 1992; Clarke *et al.*, 1997, ch. 2).

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[1] These data come from a pilot study using the company reports held in the Guildhall Library, London, for a successful application for a research grant to the Leverhulme Trust the results of which will be reported in future work.

Ultimately, of course, it is impossible to assess the impact of the way company accounts are presented on the allocation of resources but perhaps, as Edwards and Boyns (1991, pp. 186–7) argue, there is a rough consensus that the effect has been neutral. On the basis of the above discussion, though, an important point can be made: history does not bear out a reputation for excessive caution on the part of accountants in their role as 'bean counters'. There has been much recent academic discussion with regard to the commercialisation of the accountancy profession in their auditing role (see, e.g., Hanlon, 1994). The existing literature, however, indicates that the professional accountant has always taken a commercial view, which is not surprising given that auditors have always been engaged and remunerated by company directors and not the shareholders in whose name they act. The accountant can be accused on a number of different counts with regard to the vexed issue of the presentation of accounts and their audit (Mitchell *et al.*, 1993), but in *general*, excessive caution based on lofty professional principles is not and probably never was one of them.

THE ACCOUNTANT'S ADVICE

The second role the accountant has performed is that of company adviser. Indeed, it is a role which shades imperceptibly into auditing since, as noted above, auditors have always looked upon it as part of their role, if asked, to suggest improvements to the way a company was organized and run. In the 1950s, British accounting firms began to set up separate departments to handle their advisory services, hitherto called 'special work' but which was increasingly termed management consultancy. This became the fastest growing aspect of their business, and they were so successful at it that by 1991 of the ten largest management consultancies in Britain only two were not accountants in origin (Matthews *et al.*, 1998, p. 200).

There have been a number of specific criticisms of the type of advice accountants have given industry in the past. Armstrong (1987, p. 423) has argued that part of Britain's industrial problem has been that accountants have advanced themselves in management in opposition to engineers. The accountants have succeeded, he argues, by characterizing the problems of companies as financial rather than 'operational' or technological, and in seeing the solutions in financial terms in the form of mergers, the creation of holding companies and the divisionalized company form, which needed audit-based controls.

This tends to do rather crude injustice to the accountant. There is little or no historical evidence that accountants in their advisory role have ignored or downplayed the importance of technology for companies. Indeed, from the earliest days, as Jones (1981, p. 65) has noted:

> It was not enough, therefore, for an auditor to be expert in accounting; he needed to have a reasonable knowledge of the company's technical operations and always to be a good judge of people to check that all was as it should be. For example, when Edwin Waterhouse was called upon to report on the financial state of the British Ice Making Company in 1864, he recorded that he had 'inspected the machinery and works of the company at Barking. The machinery is apparently in perfect working order...'

The wording of many audit reports on the accounts of British quoted companies showed an understanding of the importance of and concern for the preservation of the company's plant, and that, as we noted above, provision was made for depreciation.

Armstrong's general criticisms of the accountant's advice seem to have in mind their role as consultants, particularly in the interwar period. But the flaw in his argument is that blaming accountants for seeing problems only in financial terms in the years of depression is rather like blaming plumbers for only seeing problems in terms of leaking pipes. Consultant accountants, like Sir William McLintock or Sir William Plender, were primarily called in to help companies in dire straits, typically in the declining old staples like steel and cotton. They were not contracted to plan a program of solutions based on technological innovation—which indeed was simply not feasible in the circumstances. Accountants, when looking at the steel industry, for example, were aware of the long-run importance of capital investment and re-equipment, but in the short-run a company's difficulties are by definition financial. A company or industry may have a list of long-term problems caused by lack of investment and technical innovation, weak sales and marketing, or bad industrial relations, but in the short-term the only way these threaten the existence of the firm is financially; and by that stage (nearing bankruptcy) the only solutions are financial. Moreover, there is no evidence of accountants distorting the nature of the problems of industry in the interwar period so as to advance the market value for their financial skills, as Armstrong argues.

Business historians, like Locke (1984, p. 132) have argued that British accountants gave bad advice on mergers, while to Alford (1976, p. 61):

> it is not so much a question of companies suffering a shortage of professional financial advice as one of the nature of the basic principles of accounting which determined the quality or, more accurately, the appropriateness of the advice proffered. For example, the reorganisation of the British steel industry between the wars seems to have been bedevilled by zealous accountants proffering putative solutions which appeared satisfactory in narrow financial terms but which made far less sense in relation to technical and commercial requirements.

Again the accountants can be defended from these rather sweeping charges regarding the interwar steel industry. Payne (1979, p. 156) reports that in 1923 Sir William Plender was asked to formulate a scheme of amalgamation in the steel trade in Scotland but his report was 'lacking in depth and unconvincing in its recommendations'. Yet it is clear that his later proposal for a mammoth holding company was not implemented because the parties could not reach agreement on their share of the resulting company (Payne, 1979, p. 158). Other amalgamation schemes for Scottish steel put forward by Sir William Peat in 1926 (Payne, 1979, p. 167) and Sir William McLintock in 1930 also foundered for the same reason not, apparently, because of any inherent fault in the plans themselves (Payne, 1979, p. 193; Tolliday, 1987, p. 109). And the accountants were not the only ones unable to get all sides to agree. In 1929, another amalgamation scheme by H. A. Brassert, the Chicago firm of consulting engineers, after a detailed technical report, also failed and for similar reasons (Payne, 1979, pp. 170–80). However, in 1924, success had crowned the efforts of Peat and Plender, who designed the merger between Dorman Long and Bolckow Vaughan (Tolliday, 1987, p. 69). Sir William McLintock also played a major part in the successful amalgamation of David Colvilles and James Dunlop, the two Scottish steel companies, in 1930 (Payne, 1979, p. 189; Tolliday, 1987, p. 107), and when Colvilles moved towards rationalization through a program of acquisitions, he played a 'crucial role' (Payne, 1979, pp. 213–16, 243). Since, therefore, they had their successes where the conditions were right, while other consultants failed along with the accountants where they were not, it is difficult to see why Plender, Peat or McLintock, in their attempts at the rationalisation of the interwar steel industry, come in for the odium heaped on them by Alford, Locke and others.

There is no doubt British accountants were strong advocates of the holding company in the interwar period. McLintock was an inveterate midwife to this business form and Plender, as well as his work in the steel industry, helped Huntley & Palmer form a holding company in the 1920s (Corley, 1972, p. 206). This stance opens the accountants up to further criticism. To Armstrong (1987, p. 430) the holding company meant no rationalization or reallocation of resources, a lack of planning and only 'weak and exclusively financial control' by audit; indeed it was a further example of accountants pressing mere financial solutions rather than operational ones. Chandler (1990, p. 288) has seen the holding company, in contrast to the more virtuous multidivisional company form, as allowing the continuation of family control with all its three pronged ills—a lack of investment in production, marketing and management.

The holding company issue will also bear some detailed discussion. First, there is a problem of definition which is not acknowledged or addressed satisfactorily by either the historians or the economists and management theorists working in the area of corporate structure. The usual definition of the holding company is that it holds a controlling stake in the shares of, and to a small extent coordinates, a loose federation of legally separated subsidiary companies (see, e.g., Lowes *et al.*, 1994, p. 5). Chandler's multidivisional company on the other hand is one legally consolidated firm which organizes its activities into semi-autonomous divisions but where key functions like research, the overall strategy of the group and the allocation of resources are centralized (Chandler, 1982, p. 18). Clearly, however, both forms rarely exist in their pure manifestation. M-form companies have subsidiaries, while many so-called holding companies are organized into divisions (Channon, 1973, p. 93; Steer and Cable, 1978, p. 14; Hill and Pickering, 1986, p. 33). When economists, like Williamson, attempt to differentiate the two forms to analyse their performance they tend to do so on the grounds of the degree of centralization of decision making, not on the legal structure of the companies, which makes the distinction between the two forms subjective and somewhat arbitrary (Hill, 1985, pp. 210–11).

Historically, too, there is sufficient imprecision and an avoidance of clear definition as to make Chandler's attack on the holding company misdirected. To Chandler (1990, pp. 246–9), Imperial Tobacco is the archetypal holding company that allowed no change in the structure of competing family firms and as such epitomized what was wrong with the British system. Yet to Hannah (1976, p. 199), Alford's history of the company suggests that it achieved 'many of the advantages of a multidivisional structure within the holding company form'. Moreover, Imperial Tobacco was not damaged sufficiently by its structure to prevent it, by Chandler's (1990, pp. 668, 681) own evidence, going from the fifth largest company in 1919, with a value of £22.8m, to becoming the largest manufacturing company in Britain by 1948, valued at £257.8m.

Although to Chandler (1976, p. 40) they were damned as loose federations of family enterprises under weak control, and to Channon (1973, p. 89) the form 'represents extreme decentralisation', it is clear that often among the holding companies drawn up by accountants a high proportion of strategic planning was undertaken by head office. The holding company at Nobel, the chemical firm formed in 1920 and designed to some extent by McLintock, was the seat of a centralized administration which made few concessions to the autonomy of the constituent companies; purchasing, personnel, publicity, legal, taxation and investment matters were centralized (Jones, 1981, p. 154). Moreover, it is by no means clear that Nobel was the exception as Chandler (1976, p. 44) maintained. Although Unilever was organised as two holding companies, the accountant chairman, d'Arcy Cooper, strove hard to unify the company (Edwards, 1984, p. 783). Whinney, Smith and Whinney devised another scheme of amalgamation among firms in the cotton industry in 1933, but the holding company was to make all the policy decisions relating to the group (Jones, 1981, p. 161). Webster Jenkinson exercised firm control from the centre at Vickers, and at GKN, another steel and engineering combine, the accountant Jolly sat on the boards of a number of the subsidiaries as the group's representative and carried through a major modernization of the whole group's activities (Davenport-Hines, 1985, p. 486; Jones, 1985, p. 526; 1990, pp. 287, 369). Hannah (1976, p. 199) also believed that in the interwar years, Lucas, the electrical components holding company run by another accountant, Bertram Waring, 'in some respects operated ... as a multidivisional structure under head office control'. At Courtaulds, the accountant Kinnes was a strong advocate for the holding/subsidiary companies structure implemented in 1947, but with the former having responsibility for controlling broad policy and finance (Coleman, 1969, pp. 222, 224).

Chandler and other historians have tended, therefore, to jump to conclusions regarding the organizational difference between a holding company and a divisionalized concern. Some holding companies kept a firm grip on subsidiaries, while a divisionalized firm like GEC, for example, in the 1970s and 1980s allowed a large measure of autonomy to the divisions. Arnold Weinstock applied only strict financial controls using a small head office staff, where, incidentally, it has been suggested the accountant, Kenneth Bond, played a key role (Channon, 1973, p. 136; Williams *et al.*, 1983, pp. 175–6; Cowe, 1993, p. 285).

Moreover, although Armstrong (1987, p. 426) for one is critical of mergers and holding companies as solutions to corporate problems, he does not offer examples where these were ill-advised or unsuccessful. The evidence on which Chandler bases his antipathy towards holding companies is equally slight. At times the mere identification of a concern as a holding company is apparently enough to condemn it. Yet Hannah (1976, p. 199) argues that a 'holding company structure was compatible with a number of practical organisational forms and the existence of a holding company is not by itself, an indication of inefficiency'. Jolly's GKN, for example, comes in for considerable criticism from Chandler, when again by his own data it rises from nineteenth largest company in Britain, with a market value of £8.2m in 1919, to thirteenth valued at £35.3m in 1948 (Chandler, 1990, pp. 317, 671, 685). While these data do not, of course, prove that GKN was successful by other measures such as profitability, you would have expected Chandler to explain how they are compatible with his criticisms of the company.

Many holding companies were indeed highly decentralized, for example, the pharmaceutical company, Beechams Pills, a family firm built up by mergers and in the 1930s under the leadership of accountants like Louis Nicholas, Stanley Holmes and Bernard Hobrow (Lazell, 1975, pp. 27, 77, 90). The firm operated through a large number of subsidiaries, and no attempt was made to rationalize or consolidate the new businesses acquired. Yet the weaknesses of the holding company are again by no means apparent in view of Beecham's results in this period. The company went from being 138th largest British company with a market value of £2.3m in 1930, to 34th largest with a market value of £22.4m in 1948 (Chandler, 1990, pp. 676, 683).

The rhetorical point might also be made that if the holding company were such a bad corporate form, why has it lasted so long? To Channon, writing in the early 1970s, the holding company was clearly on its way out. Whereas 40 per cent of his sample of large British companies were so called (but not defined) holding companies in 1960, by 1970 this had fallen to 20 per cent (Channon, 1973, p. 73). The structure had only survived into the 1950s, according to Channon (1973, p. 89), 'due to a lack of ability to innovate the more sophisticated control and planning mechanisms which form a necessary ingredient of a multidivisional system'. Yet the demise of the holding company (favoured by British accountants) amid the onward march of the M-form (advocated primarily by American management consultants), has not materialized. In 1996, nineteen of the FT-SE hundred largest British companies at least called themselves holding companies, including the largest, British Petroleum (also the nineteenth largest company in the world), while a further two companies, the conglomerates Hanson and Tomkins, were clearly holding companies in form, yet styled themselves 'industrial management companies' (*Financial Times*, 24 January 1997).

The reason for this stubborn longevity is clear. Estimates of the relative performance of the holding company and the M-form structure in the 1970s and early 1980s in Britain and America tended to favour the latter (Steer and Cable, 1978,

p. 28; Teece, 1981, p. 190). However, more recent investigations of German and Japanese companies did not support these results, while work in Britain in the 1980s showed that the pure form of multidivisional firm was not as common as earlier studies had showed, and the holding company continued to be popular (Cable and Dirrheimer, 1983, pp. 43–62; Cable and Yasuki, 1985, pp. 401–20; Hill, 1988, p. 214). Other studies, by Channon (1978) himself in the service sector and by Grinyer, *et al.* (1980, pp. 193–220), found no link between the M-form and superior profitability; indeed Hill (1988, p. 77) found a negative relationship. Moreover, in another study, holding companies showed up as more profitable than the pure M-form, which suffered from too powerful divisions hampering financial control (Hill and Pickering, 1986, pp. 36, 43). In fact, as a result of the poor performance of the M-form structure some companies in the insurance sector in the 1980s and early 1990s abandoned it and reverted to the unified functional corporate structure (Ingham, 1992, p. 466).

All of which puts the historical advocacy of the holding company by accountants in a different light.

THE PRIESTHOOD IN CHARGE

We turn now to accountants in their role as managers. Possibly their most enduring criticisms have been that they are too cautious in their management style, are unwilling to take risks, stifle technical innovation, or are backward looking in their outlook.

That accountants are almost congenitally 'risk averse' is a common viewpoint with a long pedigree. In 1946, the editor of *Financial News* put the point well: 'Accountants ... by temperament and training, must be cautious men', and while not all accountants are 'ultra-cautious, safety-first people', nonetheless: 'Chancing his arm is the one thing which, from the signing of his articles, he has been taught to regard as the first of all the seven deadly sins'. One solution, according to the *Financial News*, was that accountants should be second in command of a firm (quoted in *The Accountant*, 21 July 1945, pp. 37–8).

This view was shared by business leaders. Lord Sieff, chairman of Marks & Spencer, the retailers, from 1972 to 1984, argued that:

> Over the last few decades many more businesses than in the past have been run by accountants. Some accountants make good administrators, and some good administrators make good chief executives. One should not generalise too freely, but it is part of an accountant's professional function to be cautious, meticulous, critical and analytical. He is there not to advise taking risks but rather to urge and advise you how to avoid them. Though there are exceptions to the rule, accountants therefore do not generally make the best principals and, though they may render great, even crucial, service in the early days of a small business, they may not be suitable to lead and energize it. (Sieff, 1990, p. 35)

Many academic management theorists also tell the same story. Some, like Earl (1983, pp. 130–1), do argue that what others see as vices are part of the accountant's legitimate and justifiable role: 'When they are accused of being conservative, traditional, ritualistic, above criticism, and interested only in financial numbers, they should not be overly concerned for such accusations describe the role of priest which has evolved for them.' Yet even here Earl tacitly accepts the criticism that accountants are cautious, while redefining it as a virtue. But almost universally the characteristics of the accountant have been seen by academics as inimical to good management. In the lead here is Charles Handy, who argues that some people believe that, 'the accountants' proper caution, inculcated by their training, can be damaging to a spirit of enterprise and initiative in management' (Handy *et al.*, 1987, pp. 173–4). Armstrong (1985, p. 129; 1987, pp. 416, 425) agrees that the participation of accountants in management has led to a 'penny-pinching negative approach'; while McKenna (1978, p. 8) too suggested that the socialization process involved in the accountant's training leads to an attachment to 'caution; exactitude; anti-theoretical pragmatism; professional exclusiveness; quantification and rationality'. Tricker (1967, p. 9) talks of the 'ultra cautious, historically orientated, conservative attitudes' of the accountant.

This view is even shared by some accountants. Norman Lancaster commenting in 1979 when fellow chartered accountant, Trevor Holdsworth, was about to become the next boss of GKN, stated that he would have liked to have seen an engineer in the job. He lamented the fact that so many enterprises were run by accountants and also argued that their training was suitable only for a subordinate role: 'I always say that accountants have a very good training, in very necessary techniques, and are ideally cast as number two or three in a company ... An accountant has to be careful, exact. I'm not certain that running a business does not involve a good element of daring and risk-taking' (quoted in Mumford, 1991, pp. 137–8).

There is a very satisfying logic to these opinions which see the caution and prudence with which accountants are trained to handle a company's accounts transfer themselves to his advice to, or behaviour in, general management. Because the accountant, the argument runs, is trained to show prudence in the valuation of assets, for example, or because company accounts are financial records of past activity, when accountants advise management or become managers themselves they will, therefore, be cautious and backward looking. Likewise because the accountant deals in financial affairs he will view all problems in financial terms and neglect the importance of, for example, technological innovation. Indeed, Bougen (1994) has argued that the stereotyping of accountants as dull rather than creative or imaginative was encouraged by accountants themselves for their own ends. If so, they have been highly successful. Yet in fact the historical and contemporary evidence for these propositions is slight.

The idea that the accountant takes his cautious financial training with him into general management can be shown to be very largely a myth. Accountants did not and, as we have argued elsewhere (Matthews *et al.*, 1998), could not have achieved their success in general management because of their technical proficiency as accountants. Although the model is neat, the difference in the two functions is well understood. As Tricker (1967, p. 18) has stated: 'It is important to recognise the distinction between the man in the functional accounting role and the accountant by training and experience in another managerial post, since attributes which are commendable in one office can be a handicap if carried over into the other'. Accountant managers themselves appear well able to distinguish between their skills as accountants and the requirements of general management. For example, as one accountant (a top executive in an investment company) put it in the 1980s: 'Accountancy training is useful for the mechanical side, but good mechanics seldom make a bad deal good' (*Accountancy*, October 1989, p. 16). Paul Girolami, accountant and chairman in the 1980s and early 1990s of Glaxo, the pharmaceutical company, said: 'It is not an accounting job, to run a business'—'accounting techniques are not management techniques' (*Accountancy*, April 1992, p. 26). When Morita, chairman in the early 1990s of Sony, the Japanese electronics company, added an Oriental voice to the chorus of disapproval of accountants at the head of British companies, Girolami pointed out in reply that Morita himself was not an engineer but a top manager: 'If he were to run Sony as an engineer it would be a shambles. And equally, if I were to run Glaxo as an accountant we wouldn't get started' (*The Director*, November 1992, p. 106).

What then is the record of accountants in general management? In fact, historically there is no shortage of examples of accountants who reached the top in management in Britain who were able, aggressive and displayed every willingness to take risks in their own careers and with their respective companies. Accountants have been prominent in the high-risk industries like oil exploration. William Ewing Eadie, Robert Paterson Smith, John Strain and Sir Alastair Down were all chairmen or top executives of Burmah Oil; while Sir Eric Drake went to work for the Anglo-Iranian Oil Company in 1934, eventually becoming chairman of the re-named British Petroleum in 1955 (Corley, 1985, p. 159; 1988; Ferrier, 1984, pp. 169–72). Other accountants showed that they did not lack business aggression. Basil Smallpeice, for example, took on the government in 1963 over how the nationalized concern, BOAC, the airline, should be financed and run, and eventually resigned (Higham, 1986, pp. 191–2). It was said that Girolami's success at Glaxo was due to a 'willingness to risk the known for the unknown, a comfortable performance for a potentially sensational one' (*The Director*, November 1992, p. 108). As the head of Grand Metropolitan, Allen Sheppard acquired the huge American Pillsbury company in 1989, and undertook a risky breweries for pubs swap with Courage in 1991; while Nicholas Wills as director of BET was buying 'three companies a week' in the 1980s (Cowe, 1993, pp. 43). Certainly, accountants do not, today at least, see themselves as being cautious. In a survey of finance directors conducted in 1993, 53 per cent said that their role in respect of risk taking was to take reasonably calculated risks and 25 per cent said that they should be part of a risk taking team. Only 22 per cent responded that they should act on the side of prudence and less than 1 per cent that they should be extremely cautious (Owen *et al.*, 1993, p. 17).

But the best evidence that accountants were not the grey, over-cautious wimps of Monty Python legend are the examples of the profession who exhibit all the characteristics expected of the entrepreneur. These enterprising accountants date back at least to the career of John Reeves Ellerman, who built up a shipping line and amassed by the time of his death in 1933 perhaps the largest personal fortune by any British industrialist before or since (Rubinstein, 1984, pp. 249, 255). A lesser known example is the chartered accountant, Bernhard Heymann Binder, who set up various public utility companies in South America before the First World War (Parker, 1980; *The Times*, 12 July 1966). Towards the end of the war, however, Binder decided to return to the profession and went into partnership with R. Ashton Hamlyn and took on a wide range of directorships, totalling seventeen by 1939, including BTR and many foreign companies. Many other accountants were very active in the speculative and high-risk foreign mining sector before the First World War (Harvey and Press, 1990, p. 98). Again, Andrew Wilson Tait, a partner of George Touche, by the interwar period 'had become one of the best-known entrepreneurs of the business world and had been able to amass a fortune of about half a million pounds' (Richards, 1981, p. 20; Davenport-Hines, 1986, p. 429).

Successful entrepreneurial accountants in the post Second World War era include Julian Hodge, the certified accountant, who rapidly amassed a financial empire based in Wales (Baber and Boyns, 1985, pp. 286–90). In the 1980s, Nigel Rudd and another chartered accountant, Brian McGowan, built Williams Holdings from nothing into one of the hundred largest companies in Britain (*Accountancy*, November 1991, p. 24; *The Director*, June 1991, p. 41; *Who's Who*, 1993, p. 1642). Other contemporary enterprising accountants include: Godfrey Bradman, the property developer; Barry Hearns, the sports promoter; Martyn Arbib, who founded and built Perpetual into one of the most successful unit trusts of the 1980s and 1990s; Ian Williams, who left Touche Ross in 1991 and helped take over Smiles brewery in Bristol in a management buy-out (*Sunday Times*, 26 December 1993; *Accountancy*, February 1994, p. 54; *Accountancy*, April 1995, p. 28; Jeremy and Tweedale, 1995, p. 22). Perhaps typical of the present day accountant entrepreneurs is John Corrin, who when head of Allied Textile Companies in 1993 stated: 'I enjoy making decisions and taking risks. I am not always right but I stand by them' (*Accountancy*, March 1993, p. 22).

Nor is there sustained evidence that accountants in their role as managers neglected the importance of engineering, technology, capital investment or efficient production in favour of financial considerations. There is one instance in the secondary literature of an accountant manager, Eric Turner at BSA the failing motorbike makers, who is accused of neglect of the technical and production side of the business in favour of the financial aspects (Ryerson, 1980, p. 176; Smith, 1986, p. 573). But BSA was, of course, only performing on a par with the rest of the U.K. motorcycle industry in the 1950s and 1960s, and this case would seem to be untypical. For example, in the steel industry the restoration of companies like Stewarts and Lloyds and Dorman Long in the 1930s and 1940s was on the basis of massive capital re-equipment in the latest techniques under the accountants in charge: Allan Macdiarmid and Sir Ellis Hunter, respectively (Boswell, 1983, pp. 95, 158). Among many examples of accountant managers keenly aware of the importance of technical advances, the accountants Girolami or Holdsworth placed emphasis on long-range research and development as heads in turn of Glaxo and GKN (Ritchie and Goldsmith, 1987, p. 115; *Accountancy*, April 1992, p. 26; Cowe, 1993, p. 58). Messrs Rudd and McGowan built the success of Williams Holdings in the 1980s by buying up 'basket case' companies in the declining manufacturing sector and not asset stripping them but rehabilitating them with judicious capital re-equipment (*The Director*, June 1991, p. 41). In the 1980s and 1990s, Sir Ernest Harrison, while in charge at Racal Electronics, launched the cellular telephone network, later floated off as Vodafone (Jeremy and Tweedale, 1995, p. 85). Unless it can be demonstrated, therefore, that it was these accountants who were the exceptions, the view of Armstrong and others that accountants only saw their management role in terms of financial solutions and neglected technology is unsustainable.

DID ACCOUNTANTS MAKE BETTER MANAGERS?

The arguments offered thus far do not of course prove that accountants made superior business advisers or managers, merely that the common or stereotypical criticisms of them are, on the available evidence, unjustified. On the other hand, it is quite easily demonstrated by historical examples that the accountant's training and experience was not a guarantee of excellence or success as a business adviser, manager or entrepreneur. History offers numerous instances where accountants seemed to make poor managers and, moreover, made commercial mistakes in areas which their financial expertise might have been expected to guard against.

Tracing company histories through the *Stock Exchange Year-Book* shows, for example, the Lancashire Watch Company, which was first registered in 1888, fell on hard times and was reconstructed in 1897 with two accountants on a six member board. By 1911 it had failed to pay a dividend and had accumulated losses of £361,496. The West India and Panama Telegraph company had had an accountant on the board since 1883, but still struggled to pay a dividend by 1911. Likewise, the New Peterborough Brick company, where the accountant C. H. Wells had been a director since 1899, was still not paying a dividend down to the First World War. Again, the accountant E. R. Painter seems to have been instrumental in the formation by merger of the Petersfield and Selsey Gas Company in 1901 which, unusually for a gas concern, remained unprofitable until Painter's departure ten years later.

More recently, we have already noted the failure of Turner at BSA. Likewise Nicholas Wills, in charge at the conglomerate, BET, was accused of over-extending the company and burying it under a mountain of debt as the recession of the early 1990s hit; he was forced out in 1991. The new regime at BET is reported to have 'found that financial and management controls were almost non-existent due to the previous preoccupation with acquisitions and the philosophy of decentralisation which left individual businesses to go their own way' (Cowe, 1993, p. 195). Holdsworth's otherwise successful stewardship at GKN in the 1980s, was also not without blemish. One apparent mistake was to buy into the defence industry through a stake in Westland Helicopters in 1988 (Cowe, 1993, p. 287). While chairman of GKN, Holdsworth also held an array of non-executive directorships including director of the Midland Bank, 1979–88, a period when the bank suffered the 'unqualified disaster' associated with the takeover of the American Crocker

National Bank, the prelude to the Midland itself being taken over by the Hong Kong and Shanghai Banking Corporation in 1992 (Hast, 1990, p. 319). Interestingly, a number of other accountants—Holden Brown, Hay Davison and Michael Julien—were either on the board or working in senior positions for the Midland in the 1980s but were unable to prevent its demise as an independent company (*Who's Who*, 1993, pp. 482, 901, 1022).

A number of leading accountants were involved in the decline of the conglomerate, Trafalgar House, in the 1980s. Harry Benson was, from 1982 to 1985, the chairman of Davy Corporation, 'another great engineer fallen on hard times', when they entered into an oil rig contract 'taken on at ridiculously low cost because the company was desperate for business and which turned out to incur huge additional costs' (Cowe, 1993, p. 427; *Who's Who*, 1993, p. 145). This move in turn brought Trafalgar House to its knees. Another chartered accountant, Eric Parker, had for most of his career been associated with the extraordinary growth of Trafalgar House, the company created by Sir Nigel Boakes, and by the early 1980s Parker was Boakes' 'right hand man' (Cowe, 1993, p. 427; *Who's Who*, 1993, p. 145). The purchase of the Davy Corporation in 1991 without fully appreciating the disastrous commitments that company had, was Boakes' and Parker's undoing and paved the way for the acquisition of a significant minority shareholding by a group backed by Jardine Matheson and the removal of Boakes and Parker. Under Parker's stewardship, Trafalgar House's market valuation fell from £1.1 billion in 1985, when it was rated the twenty-ninth largest company in Britain, to half that value and a position outside the top hundred companies in 1993 (Wardley, 1991, p. 280; Cowe, 1993, pp. 425–9). Nor were the entrepreneurial accountants uniformly successful. The chartered accountant, Richard Ross, was the husband of Sophie Mirman and the other half of the team that made Sock Shop, founded in 1983, such a success, with a hundred shops in the U.K. by 1988. But the company apparently then over-extended itself moving into the U.S. market and by 1990 had collapsed spectacularly (*Financial Times*, 4 July 1990).

It is a point worth emphasizing, however, that these examples of apparent failure arose for the most part not because of the accountant's fabled prudence but because their companies over-reached themselves.

RECENT QUANTITATIVE EVIDENCE

As business historians are well aware, arguing by individual case is never likely to be entirely persuasive. Of more value in this instance would be a statistical analysis relating management characteristics to their company's performance, and several contemporary studies have attempted this. Using data from the 1980s, Silver (1990, pp. 237–47) found no correlation between management training and company performance as measured by return on capital employed. Wood (1991) did find some statistically significant better performance among a small group of manufacturing companies whose chief executive officers had qualifications, although the actual qualification did not seem to be important. Wood's sample was probably too small to be conclusive, however.

TABLE 1

A SAMPLE OF TOP EXECUTIVES DIVIDED BY QUALIFICATION AND RANKED ACCORDING TO A RANGE OF PERFORMANCE MEASURES

(best = 1 to worst = 4)

	Performance measure	Unqualified	Scientists, engineers and technologists	Accountants	Other graduates
1	Flight-not-fight	4	2	1	3
2	Overall success	4	3	1	2
3	Success in R&D	4	1	2	3
4	Success in using new technology	3	4	1	2
5	Weighted average rank	3.9	2.4	1.6	2.1

Source: Barry *et al.* (1997, p. 53).

Of more relevance to the present discussion are the recent findings of Barry *et al.* (1997), which allows direct comparison between accountants and other qualifications in top management. They measured the performance of the top executives of 263 manufacturing companies in Britain for the years 1990–94 using various criteria and then grouped them on the basis of their qualifications. Their results are summarized in Table 1. Row 1, the 'flight-not-fight' test, refers to those top executives that chose to discard their poorer businesses in response to the 1990s recession, assumed by Barry *et al.* to be a measure of 'short-termism'. Row 2 combines an 'economic value added' measure of performance with the 'flight-not-fight' measure to assess 'overall success'; and rows 3 and 4 refer to success in using R&D and new technology. The top executives were grouped according to their qualifications and their performance was ranked on a scale of 1–4, from best to worst. The ranking for each performance measure of the qualification groups was then weighted by the statistical significance of the results, and an overall average ranking was then calculated (row 5).

As a result of the evidence in Table 1, Barry *et al.* (1997, p. vii) concluded: 'among companies headed by qualified top executives those run by accountants tend to outperform all others . . . The accountants' superior performance is evident in the operational as well as in the financial performance measures.' With regard to the 'flight-not-fight' measure they noted: 'In popular demonology TEs [top executives] who are accountants are believed to be particularly guilty of this kind of defeatist short-termism . . . Far from being the villains, the accountant TEs perform outstandingly well in this regard. The injustice of popular folklore!' (p. 47).

Interestingly, in the light of one of the main arguments of this article, Table 1 also shows the accountants scored particularly highly in their success in using new technology.

The results of Barry *et al.* should be treated with some caution since their sample included only relatively small manufacturing companies and applied to one period—the early 1990s. Moreover, the usual caveat regarding statistical correlations is appropriate since the exercise proves nothing about causation. Barry *et al.* (p. 55) are aware of this problem, however, but argue against the possibility of a reverse causation, whereby successful companies might have tended to appoint accountants, since they found no case where one accountant followed another in the same top job.

Barry *et al.* explain the accountants' success as due to the fact that in their informal training accountants see the way that many different companies operate, while even their auditing 'grunt work' 'helps them to learn how to spot the real sources of a company's wealth generation and—every bit as important—how to spot the holes down which a company's wealth may be draining' (p. 79). They also thought an accountant's background is important. One leading accounting firm they reported took graduates from a wide range of disciplines (only 5 per cent had accountancy degrees) and the characteristics they looked for were 'influencing skills; fertility of ideas and quality of oral communication'.

CONCLUSIONS

The purpose of this article has been to survey the influence of accountants in British management on economic performance. Hitherto this influence has been seen almost unanimously by a wide variety of commentators: business historians, management academics, journalists, managers themselves, and even politicians, as undesirable. This view is not justified. On the basis of the available historical evidence there are no grounds for the crude stereotypical criticisms of the influence of accountants that, either in their role as practitioners or working 'in business', they were cautious, backward looking or viewed problems in merely financial terms. They did in all their roles appear to favour the holding company form of corporate structure but it has been argued that this was no bad thing. As general managers accountants seemed capable of shuffling off the mantle of their financial specialism and taking a well-rounded view of their duties and in particular the importance of investment in technology.

There remains the question as to whether accountants actually made better managers than those with other backgrounds, and were therefore a positive influence on Britain's economic performance. This must remain an open question which will not be resolved by citing examples, as we have done here, of the many successful accountant managers. We have noted above a plentiful list of accountants who apparently failed in the top jobs; and elsewhere I have pointed to a number of successful entrepreneurs and managers with, for example, an engineering background (Matthews, 1999). There are, however, *a priori* and some empirical reasons for believing that indeed the accountants did make superior managers.

I have discussed in detail elsewhere (Matthews, 1999) that on a range of objective criteria, the training and experience of the British chartered accountants gave them a unique preparation for a role in general management in comparison to other qualifications, not excluding the modern MBA. Moreover, from an economic rationalist viewpoint the very success of the accountants in reaching the top management jobs in such large numbers is an argument in itself for their superiority. If you assume that companies, that is boards of directors, act rationally and engage in profit maximizing behaviour the fact that so many accountants have been promoted to the top jobs, outdistancing all other qualifications, suggests that they were considered beneficial to profitability. There are many, of course, perhaps even the majority even among economists, who do not accept the neoclassical presumption of rationality and profit maximization. The onus, however, should be on those with that point of view to argue, theoretically or with evidence, why and how over a period of a hundred years British companies increasingly and repeatedly made the wrong choice of managing director or chairman when they appointed an accountant. What would also need explaining is the success world-wide of British chartered accountancy firms as management consultants. Why would companies continue to pay high fees over many years for the accountant's advice on all aspects of managing a business, from IT to marketing, if it was cautious, backward looking, ignored the importance of technological innovation or just plain wrong?

And finally, the best available empirical evidence which impinges on this issue, that of Barry *et al.* (1997), discussed above, does suggest that the accountancy qualification produces the best top executives. Although the weight put on this evidence must be limited, nonetheless it is suggestive that the one study with a quantitative basis confirms the thrust of the argument of this article. We can conclude, however, with an almost equally telling aspect of Barry *et al.*'s (1997, p. 105) study. Despite the fact that their own evidence demonstrates the superiority of accountants, what conclusion do they draw from this? What British management needs is more engineers in the top jobs.

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TERENCE BU-PEOW NG, WENDY GREEN AND ROGER SIMNETT

The Effects of Fraud Risk and Management Representation on Auditors' Hypothesis Generation

Hypothesis generation is considered to be critical to the effectiveness and efficiency of diagnostic processes in auditing. Using a between-subjects experimental design, this work examines the impact of fraud risk and the availability of a non-misstatement management explanation on auditors' hypothesis generation performance. The context is when managers undertake analytical procedures at the planning stage of the audit. The results indicate that auditors are sensitive to increased fraud risk by generating more fraud hypotheses, while the number of misstatement hypotheses generated is not affected by fraud risk. The availability of a non-misstatement management explanation was found not to interfere with auditors' hypothesis generation performance, but facilitated the generation of proportionately more misstatement and fraud hypotheses from the same transaction cycle as that indicated by the management explanation. Together, these findings provide some insights on the sensitivity of auditors' hypothesis generation to fraud risk and whether this sensitivity could be undermined by the availability of management representations.

Key Words: Fraud risk; Hypothesis generation; Management representations.

Hypothesis generation is considered to be critical to the effectiveness and efficiency of diagnostic processes in auditing (e.g., Bedard and Biggs, 1991; Heiman-Hoffman *et al.*, 1995; Asare and Wright, 1998). However, previous experiments have not investigated whether auditors' hypothesis generation performance is sensitive to fraud risk. Further, while auditors often seek and rely upon management representations in performing analytical procedures (Hirst and Koonce, 1996), over-reliance

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on management representations may lead to failure in detecting fraud (Knox, 1994). Koonce (1993) suggests that management have incentives to offer non-misstatement explanations[1] in response to auditor inquiries, particularly when management fraud is involved. In a recent fraud survey in the U.S., it was found that a large proportion of detected frauds involved the top management (Beasley *et al.*, 1999). Therefore, a study of whether auditors' hypothesis generation is sensitive to fraud risk, and whether such sensitivity is affected by the availability of management representations, is important for better understanding factors that could potentially affect auditors' effectiveness in fraud detection.

The detection of fraud by auditors is one of the most controversial and pressing issues facing the auditing profession today (e.g., Anonymous, 1999; Carmichael, 1999; Landsittel, 2000). Auditors are required to plan and conduct the audit so as to provide reasonable assurance of detecting material misstatements caused by both fraud and errors (ISA 240; International Federation of Accountants [IFA], 1995a). A material misstatement resulting from fraud is inherently more difficult to detect than one resulting from errors, as the former usually involves deliberate concealment and/or intentional misrepresentations made to the auditor (ISA 240; SAS No. 82; Loebbecke *et al.*, 1989; Shibano, 1990). Not surprisingly, some studies have suggested that auditors have not been effective in detecting material fraud in financial reports, with this remaining one of the major grounds for auditor litigation and regulatory sanctions (e.g., Palmrose, 1987; KPMG, 1996; Bonner *et al.*, 1998; Beasley *et al.*, 1999).

While the ISAs are currently adopted in most countries, the recently introduced SAS No. 82 (AICPA, 1997) in the U.S., which requires auditors to separately assess and document the risk of fraud, has been viewed as an attempt to improve auditors' ability to detect fraud (Zimbelman, 1997). The International Auditing Practices Committee (IAPC) has a review of ISA 240 as part of its work program, to determine whether this standard accurately reflects auditors' responsibility for fraud detection. These developments and reviews have been accompanied by calls for research into the circumstances and conditions affecting an auditor's ability to detect fraud (see, e.g., Landsittel and Bedard, 1997; Landsittel, 2000).

Although fraud detection could occur at any stage in the audit process, the importance of the audit planning stage for the identification of potential fraud and errors material to the financial report has been emphasized in the professional auditing standards (ISA 300; IFA, 1995b). As part of their initial audit planning, auditors are required to evaluate the inherent and control risks of the client so as to determine the nature, extent and timing of subsequent audit procedures (ISA 400; IFA, 1995c). Analytical procedures are also applied during the planning stage of the audit as an attention-directing tool to identify potential misstatements arising from fraud and errors (ISA 520; IFA, 1995d). This study examines auditors' hypothesis generation when undertaking analytical procedures at the planning stage of the audit.

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[1] In this article, a non-misstatement explanation or hypothesis refers to one which attributes the source of a problem (e.g., unusual ratio fluctuations) to an environmental cause rather than a misstatement (whether error or fraud).

Although auditing studies have generally recognized the importance of hypothesis generation to auditors' effectiveness in detection of material misstatements (e.g., Bedard and Biggs, 1991; Ismail and Trotman, 1995; Asare and Wright, 1998), they have concentrated on the generation of misstatement hypotheses in general, without distinguishing between fraud and error. The current experiment makes a distinction between misstatement hypotheses attributed to fraud (i.e., fraud hypotheses) and those not attributed to fraud, consistent with the distinction made between fraud and errors in the auditing standards and literature (e.g., Coakley and Loebbecke, 1985; SAS 82).[2] This distinction is important because audit procedures that are effective for detecting a misstatement that is unintentional may be ineffective for detecting one that is intentional (SAS 82; Loebbecke *et al.*, 1989; Shibano, 1990). Prior research also indicates that the *nature* of hypotheses generated may affect the effectiveness of subsequent audit tests and the eventual detection of misstatements (Heiman-Hoffman, *et al.*, 1995; Bedard *et al.*, 1998).

This work reports the results of a controlled experiment in which two situational factors, namely the level of fraud risk and the availability of a non-misstatement management explanation, were manipulated using a between-subjects factorial design. Although reliance on management representations may be an important strategy for audit effectiveness and efficiency given management's likely superior knowledge about the company's business and operations, this reliance is only justified if those representations are reliable. However, management may have incentives to offer non-misstatement explanations (Koonce, 1993), or intentionally provide misleading explanations if they are involved in fraud (SAS 82; Johnson *et al.*, 1993; Beasley, 1999). If the availability of a non-misstatement management explanation interferes with auditors' hypothesis generation, audit effectiveness may be impaired, particularly when the risk of fraud and therefore the likelihood of intentional misstatements is high.

The results indicate that when fraud risk is increased, auditors have a higher propensity to generate fraud hypotheses, although the number of misstatement hypotheses generated remains unchanged. This suggests that auditors' hypothesis generation is sensitive to fraud risk and demonstrates the importance of distinguishing between fraud hypotheses and misstatement hypotheses in general. The availability of a non-misstatement management explanation was not found to interfere with auditors' hypothesis generation. Instead, auditors who received the management explanation directed their hypothesis generation (both misstatement and fraud hypotheses) on the same transaction cycle as that indicated by the management explanation, consistent with a facilitation effect (Collins and Loftus, 1975; Libby and Frederick, 1990). These findings suggest that auditors' hypothesis generation is sensitive to fraud risk and management representations.

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[2] While some auditing studies on hypothesis generation have noted that auditors generate distinct fraud hypotheses, these fraud hypotheses have not been separately analysed, as the focus of these studies has been on misstatement (or error) hypotheses in general. Further, because the level of fraud risk was not explicitly manipulated in these studies, the number of fraud hypotheses generated by the subjects were usually too small for meaningful separate analysis (see, e.g., Ismail and Trotman, 1995).

HYPOTHESIS DEVELOPMENT

Analytical procedures involve a diagnostic process of identifying and determining the cause of unexpected fluctuations in account balances and other financial relationships and can be conceptualized as a four-stage sequential and iterative process involving mental representation, hypothesis generation, information search, and hypothesis evaluation (Koonce, 1993). The current experiment focuses on auditors' performance in analytical procedures at the hypothesis generation stage. The importance of hypothesis generation to the effectiveness of diagnostic processes has been demonstrated in prior research. In the medical domain, for example, it was found that the primary cause of diagnostic failure in medical diagnosis was the failure of physicians to consider the true explanation in the initial set of hypotheses, and not the misinterpretation of subsequent tests (Elstein *et al.*, 1978). Similarly, in an auditing context, Bedard and Biggs (1991) found that process errors in analytical procedures occur mainly in the hypothesis generation stage.

The Effects of Fraud Risk on Hypothesis Generation

Here the effects of fraud risk on auditors' hypothesis generation performance in analytical procedures are examined. Since the likelihood of misstatements is higher when fraud risk is increased, understanding whether auditors' hypothesis generation is sensitive to fraud risk is important. Research in psychology indicates that negative stimuli lead to increased cognitive effort, more complex cognitive representations, and intensified search for causal explanations (Hastie, 1984; Bohner *et al.*, 1988; Peeters and Czapinski, 1990; Taylor, 1991). These responses represent coping mechanisms or defensive strategies that enable a person to minimize any adverse impact associated with the negative stimuli (Taylor, 1991). In the auditing context, prior works have documented that auditors modify their risk assessments and audit planning decisions in response to the presence of risk factors (e.g., Libby *et al.*, 1985; Maletta, 1993; Zimbelman, 1997). However, the impact of fraud risk on auditors' hypothesis generation has not been investigated.

It is posited here that, consistent with the theory in psychology (e.g., Taylor, 1991), when the risk of fraud is increased, auditors are more likely to exert greater effort in generating plausible misstatement hypotheses and intensify their search for causal explanations for any unusual fluctuations detected through analytical procedures. Generating a greater number of misstatement hypotheses would increase the chance that any potential misstatement present will be considered (e.g., Libby and Frederick, 1990; Anderson *et al.*, 1992; Ismail and Trotman, 1995), thereby avoiding the negative consequences associated with an audit failure. Further, since actions or audit procedures required to detect intentional or fraudulent misstatements may be different from those that are effective in detecting unintentional misstatements (e.g., SAS 82; Zimbelman, 1997), specifically attributing misstatement hypotheses to fraud by generating more fraud hypotheses would increase the likelihood of detecting any potential fraud. Together these processes are expected to lead to a greater number of misstatement hypotheses generated and, more specifically, a greater number of fraud hypotheses generated.

The following hypotheses specify the expected relationship between the level of fraud risk and auditors' hypothesis generation performance:

H1a: Auditors in the higher fraud risk condition will generate more misstatement hypotheses compared to auditors in the lower fraud risk condition.

H1b: Auditors in the higher fraud risk condition will generate more fraud hypotheses compared to auditors in the lower fraud risk condition.

The Effects of a Non-Misstatement Management Explanation on Hypothesis Generation

Research in psychology suggests that hypothesis generation performance may be susceptible to output interference, an effect which occurs when emphasis on one or more explanations results in a failure to adequately consider alternative explanations (Nisbett and Ross, 1980; Hoch, 1984; Nickerson, 1984). Cognitively, interference effects occur because similar items are believed to be stored in memory together. Therefore, provision of a cued item from a set of items increases the strength of association in memory for that item, or set of items, while the uncued set of items is left with relatively weaker associations and less likelihood of retrieval. Interference effects on hypothesis generation have also been demonstrated in the medical (see, e.g., Patel and Groen, 1986) and accounting (e.g., Moser, 1989; Frederick, 1991; Anderson *et al.*, 1992; Church and Schneider, 1993) domains. Kinney and Haynes (1990) noted that if the availability of an initial incorrect non-misstatement explanation interferes with the generation of misstatement hypotheses, auditors' effectiveness in identifying potential misstatements during analytical procedures could be adversely affected. This concern was echoed by Anderson *et al.* (1992), who observed that auditors' initial generation of non-misstatement hypotheses interfered with their subsequent generation of misstatement hypotheses in an analytical procedures task.

The extent to which the availability of a management explanation interferes with the generation of misstatement hypotheses and/or fraud hypotheses is examined by testing the following hypotheses:

H2a: Auditors who receive a non-misstatement management explanation will generate fewer misstatement hypotheses compared to those who do not receive such an explanation.

H2b: Auditors who receive a non-misstatement management explanation will generate fewer fraud hypotheses compared to those who do not receive such an explanation.

It is possible that a higher level of fraud risk may moderate any interference effect caused by the management explanation, due to increased vigilance by auditors against misleading management representations. It has been suggested in the social psychology literature that the awareness of the persuasive intent of a message can motivate the message recipient to either scrutinize more carefully or discount the message (Petty and Cacioppo, 1986). However, prior studies have shown that auditors may not always be sensitive to fraud risk (e.g., Reckers and Schultz, 1993;

Bernardi, 1994; Zimbelman, 1997). An interaction effect between the management explanation and fraud risk is not posited in the current experiment since this would involve a joint test of the interference effect and auditors' sensitivity to fraud risk.

RESEARCH METHOD

Experimental Task and Design

An analytical procedures task was carried out under controlled experimental conditions. The case materials consisted of a background description of the client, including information on its operations and industry, the audited income statement and balance sheet for the previous financial year, and two sets of three financial ratios based on the previous year's audited and the current year's unaudited financial statements. These materials were similar to those used in prior works (Libby and Frederick, 1990; Ismail and Trotman, 1995).

The three financial ratios provided for the analytical procedures task were the gross margin, current and quick ratios. These ratios are the same as those used in Libby (1985), Libby and Frederick (1990), and Ismail and Trotman (1995) and are frequently used in analytical procedures (e.g., Daroca and Holder, 1985). The fluctuations in the latter two ratios were produced by a seeded misstatement in the form of an unrecorded purchase of inventory of $12.5 million (5 per cent of total assets) which resulted in the current liabilities being understated. While the ratio movements are consistent with numerous potential misstatements, the direction of the movements is also consistent with potential fraudulent reporting (i.e., overstatement of liquidity ratios and understatement of current liabilities).

The experimental task required the auditors to list potential misstatements that could explain the changes in the two years' financial ratios, and to state their most likely hypothesis. Auditors were asked explicitly to generate only misstatements to control for potential confounding effects of non-misstatement hypotheses which may be self-generated by auditors. This is necessary, given that auditors have the tendency to generate non-misstatements (e.g., Kaplan *et al.*, 1992) which, in turn, could affect their subsequent generation of misstatement hypotheses (Anderson *et al.*, 1992). To facilitate interpretation of the hypotheses generated, subjects were asked to state the 'cause' of the potential misstatements and the journal entries needed to correct them (by specifying the accounts affected but not the amount). Mention was not made explicitly of errors or fraud in the task instructions, so as not to direct subjects' hypothesis generation towards a particular category, or to sensitize them to the experimental manipulations.

A 2 × 2 between-subjects design was used, with the level of fraud risk and the availability of a non-misstatement management explanation as the independent variables. The first independent variable was manipulated by varying the client description in the background materials. Subjects receiving the higher fraud risk treatment were presented with additional information that indicated an increase in the risk of management fraud. These management fraud indicators were selected from prior research (e.g., Hackenbrack, 1993) as well as from auditing standards and included opportunity indicators, incentive indicators and management attitude indicators. Previous studies (Loebbecke *et al.*, 1989; Hooks *et al.*, 1994) have suggested that all three types of indicators are necessary for management fraud to occur.

Specifically, for the opportunity indicators, subjects were told that the chief executive officer of the company 'controls the major decisions of the company' and that 'an internal audit function was set up by the management a year ago to conduct regular reviews of the company's operations and internal control systems. Many of the planned reviews were however delayed due to the high turnover of internal audit executives.' For the incentive indicators, subjects were told that 'the company is currently negotiating a long-term loan to finance additional capital investments for their overseas operations. This is in line with the policy to expand the company's overseas manufacturing base to take advantage of the lower costs of production' and that the chief executive officer has 'introduced a bonus-based compensation scheme which is tied to the profitability of the company'. Lastly, for the management attitude indicators, subjects were told that 'during the financial year, the former chief accountant, Jason Tan, who reported to the finance director, resigned after a dispute with the finance director. The new chief accountant, Andrew Lee, was formerly employed by a group of companies known to have engaged in aggressive business and accounting practices.' In contrast, subjects in the lower fraud risk condition were told instead that 'the management control environment is assessed to be satisfactory' and that 'the company has a well-established internal audit function which regularly conducts reviews on the operations and internal control systems'.

The second independent variable was manipulated at two levels by providing a non-misstatement explanation from the client management to half the subjects. For the treatment groups receiving the management explanation, the subjects were given the following information: 'The Finance Director has explained to you that the change in the ratios is mainly due to higher sales towards the year end to customers who are themselves experiencing increasing demand for computer products, particularly from the emerging markets such as China.' This representation was strategically placed on the same page as the financial ratios used for the analytical procedures task, which significantly reduced the chance that subjects might overlook it.

Subjects

Ninety-one auditors from two of the then Big 6 audit firms in Singapore[3] participated in the study, which was conducted during the firms' training sessions. The two firms provided sixty-nine and twenty-two subjects respectively.[4] Subjects were randomly assigned to one of the four experimental treatments. The subjects performed the experimental task in the presence of one of the researchers.

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[3] The auditing standards in Singapore are essentially consistent with the International Standards on Auditing.

[4] To assess if there were significant firm effects, we reran all the analyses in this study using Firm as an independent variable. This analysis revealed that there was a significant firm effect for the number of misstatement hypotheses generated and the likelihood assessments for fraud and error. For some reason, auditors from one of the firms systematically generated more misstatement hypotheses and made higher assessments for fraud and error. However, including Firm as a control variable yielded similar results and conclusions as those reported in the paper. Further, no interaction effect between firm and any of the experimental variables was found.

The subjects' audit experience ranged from 1.25 to 7.0 years with a mean of 3.1 years. Participating auditors were required to be familiar with the task of analytical procedures. Prior research suggests that auditors with two years of audit experience should have the knowledge necessary to perform analytical procedures tasks (e.g., Heiman, 1990; Ismail and Trotman, 1995). All except eight of the subjects had at least two years of audit experience. A separate analysis was performed after eliminating the subjects with less than two years of experience, and no difference was noted for the results of the tests of hypotheses.

Experimental Procedures

The research instrument began with a background introduction explaining the purpose of the experiment and the reason for the conciseness of the case materials, as well as providing an assurance as to the confidentiality of the subjects' responses. This was followed by the case materials, the analytical procedures task (as explained above), and a debriefing questionnaire. The subjects were instructed not to make any changes to their answers in the analytical procedures task once they had started answering the debriefing questionnaire. Violations of these instructions were not observed. As well as collecting demographic information, the debriefing questionnaire also required the subjects to make separate assessments of the likelihood of material fraud and errors in the case company on an eleven-point scale ranging from 0 to 100 per cent. Subjects were asked to make these likelihood assessments after the experimental task so as not to sensitize them to the experimental manipulations.

Coding of Hypotheses

Each misstatement hypothesis generated by the subjects was first coded according to whether it was plausible or implausible. A plausible misstatement hypothesis refers to a potential misstatement explanation for the observed unusual fluctuation that is consistent with the background materials and that could explain the direction of the ratio movements. The criteria for plausibility include whether the transaction cycle and objective violated were clearly stated, whether the effects of the misstatement on the given set of ratios could be ascertained, and whether the effects were consistent with the changes in the ratios given. Hence a hypothesis was considered implausible if it was either inconsistent with the direction of the ratio fluctuations, irrelevant in explaining the ratio changes, or uninterpretable (including cases where the journal entries given were contradictory to the description of the hypothesis). These criteria are consistent with Libby and Frederick (1990) and Ismail and Trotman (1995), except that duplicate hypotheses were ignored rather than counted as implausible hypotheses.

Each misstatement hypothesis coded as plausible was further classified as (a) a fraud or non-fraud hypothesis and (b) belonging or not belonging to the sales cycle (i.e., the transaction cycle to which the management explanation belongs). A misstatement hypothesis was classified as a fraud hypothesis *either* when the word 'fraud' was explicitly mentioned, or when the subject indicated that the misstatement was intentional in nature, consistent with prior research (e.g., Coakley and Loebbecke, 1985). Examples of fraud hypotheses generated by subjects include 'fictitious sales', 'fraud involving overstatement of trade debtors', 'overstatement of inventory to show healthier financial statements' and 'wrong classification of liabilities to improve current and quick ratios'.

The coding of hypotheses was performed separately by one of the authors and an independent coder who had five years of audit experience. The experimental treatments given to individual subjects were not revealed to the independent coder. The Cohen (1960) Kappa scores for inter-rater reliability are significantly high (0.71, 0.83 and 0.95 for coding of hypotheses by plausibility, fraud and transaction cycle respectively; $p < 0.001$). The differences in coding were subsequently reconciled by another independent coder and the reconciled results are reported.

RESULTS

Descriptive Statistics

A total of thirty-one distinct types of plausible misstatement hypotheses were generated by subjects as potential explanations for the ratio fluctuations. On average, the subjects generated 4.07 plausible misstatement hypotheses, 0.25 fraud hypotheses, and 0.74 implausible hypotheses. One subject did not generate any plausible misstatement hypotheses, eight subjects generated one, and the remaining subjects generated at least two plausible misstatement hypotheses. Nineteen (21 per cent) of the ninety-one subjects generated hypotheses about fraud, with fifteen subjects generating one fraud hypothesis and four subjects generating two fraud hypotheses. Eleven (58 per cent) of the nineteen subjects who generated fraud hypotheses also selected a fraud hypothesis as their most likely explanation for the ratio fluctuations. Of the 370 plausible misstatement hypotheses generated, 145 (39 per cent) belong to the sales cycle, 121 (33 per cent) belong to the inventory cycle, and 104 (28 per cent) belong to other transaction cycles (including the investments, loans, operating expenses and cash cycles).

Tests of Hypotheses

H1a and H1b examine whether auditors' hypothesis generation performance is sensitive to fraud risk. The ANOVA tests on subjects' post-experiment fraud and error risk assessments indicate that the fraud risk manipulation is successful. Subjects in the low fraud risk condition assessed fraud (error) risk as significantly (marginally) lower than subjects in the high fraud risk condition (means of 0.28 and 0.42 respectively; $p = 0.003$ for fraud, and means of 0.45 and 0.53 respectively; $p = 0.07$ for error). These results suggest that the fraud risk indicators are more diagnostic of fraud than of error. The differential risk assessments for fraud and error by the auditors also lend support to the call for separate risk assessments for fraud and error (Loebbecke *et al.*, 1989; Shibano, 1990), a practice which has only, to date, been implemented in the U.S. (SAS 82; Zimbelman, 1997).

TABLE 1

IMPACT OF FRAUD RISK AND MANAGEMENT REPRESENTATIONS ON THE NUMBER OF MISSTATEMENT HYPOTHESES GENERATED

Panel A: Mean (standard deviation) number of misstatement hypotheses generated

Treatment groups		*n*	Mean (s.d.)
FRDRISK[a]	MGTREP[b]		
Lower	Not provided	24	4.00 (2.27)
Lower	Provided	22	3.82 (2.15)
Higher	Not provided	23	4.22 (2.04)
Higher	Provided	22	4.23 (2.11)
Experimental conditions			
Lower fraud risk		46	3.91 (2.19)
Higher fraud risk		45	4.22 (2.05)
Management explanation not provided		47	4.11 (2.14)
Management explanation provided		44	4.02 (2.12)

Panel B: 2 × 2 analysis of variance on number of plausible misstatement hypotheses generated

Source of variation	Sum of squares	DF	Mean square	F	Sig of F
Main effects					
FRDRISK[a]	0.273	1	0.273	0.849	0.359
MGTREP[b]	0.002	1	0.002	0.005	0.945
2-way interactions					
FRDRISK MGTREP	0.000	1	0.000	0.000	0.992
Explained	0.274	3	0.009		
Total	28.263	90	0.314		

[a] FRDRISK = Fraud risk treatment.

[b] MGTREP = Management representation treatment.

H1a predicts that auditors in the higher fraud risk condition will generate more misstatement hypotheses than auditors in the lower fraud risk condition. Panel A of Table 1 presents the descriptive statistics on the number of misstatement hypotheses generated across the treatment groups while Panel B presents the 2 × 2 ANOVA results with the number of misstatement hypotheses generated as the dependent variable.[5] Although the difference in the number of misstatement hypotheses generated between the two fraud risk conditions is in the predicted direction (means of 3.91 and 4.22 for the lower and higher fraud risk conditions respectively), the ANOVA main effect for the fraud risk treatment is not significant ($p = 0.359$). Hence H1a is not supported.

H1b predicts that auditors in the higher fraud risk condition will generate more fraud hypotheses than auditors in the lower fraud risk condition. Panel A of Table 2 presents the descriptive statistics on the number of fraud hypotheses

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[5] Kolmogorov-Smirnov Z test indicated that the dependent variable was not normally distributed ($p = 0.018$). Thus the ANOVA test was performed on the data after applying square root transformation. Levene's test indicated no violation of the assumption of equal variances.

TABLE 2

IMPACT OF FRAUD RISK AND MANAGEMENT REPRESENTATIONS ON THE GENERATION OF FRAUD HYPOTHESES

Panel A: Mean (standard deviation) number of fraud hypotheses generated and proportion of subjects generating fraud hypotheses

Treatment groups		n	Mean (s.d.)	Propn[a]
FRDRISK	MGTREP			
Lower	Not provided	24	0.08 (0.28)	0.08
Lower	Provided	22	0.09 (0.29)	0.09
Higher	Not provided	23	0.35 (0.65)	0.26
Higher	Provided	22	0.50 (0.67)	0.41

Panel B: Tests of difference between experimental conditions

Experimental conditions	n	Mean (s.d.)	Propn[a]
Lower fraud risk	46	0.09 (0.28)	0.09
Higher fraud risk	45	0.42 (0.66)	0.33
Mann-Whitney test of difference in means (*p* value):		0.003	
Likelihood ratio test of difference in propn (*p* value):			0.003
Management explanation not provided	47	0.21 (0.51)	0.17
Management explanation provided	44	0.30 (0.55)	0.25
Mann-Whitney test of difference in means (*p* value):		0.372	
Likelihood ratio test of difference in propn (*p* value):			0.349

[a] Proportion of subjects who generated fraud hypotheses.

generated across the treatment groups. As the distribution of the number of fraud hypotheses generated is highly skewed with many zero observations, only non-parametric tests are conducted. The results of the Mann-Whitney test, reported in Panel B of Table 2, provide support for H1b. Specifically, auditors in the higher fraud risk condition generated an average of 0.42 fraud hypotheses compared to an average of 0.09 generated by auditors in the lower fraud risk condition. This difference is statistically significant ($p = 0.003$).[6]

In terms of the proportion of subjects who generated fraud hypotheses, further analyses (also reported in Table 2) indicate that 33 per cent of the auditors in the higher fraud risk condition generated at least one fraud hypothesis compared to only 9 per cent in the lower fraud risk condition. This difference is also statistically significant based on the likelihood ratio chi-squared test ($p = 0.003$). While the results suggest that auditors' generation of fraud hypotheses is sensitive to the level of fraud risk, whether this finding is reassuring is arguable, since 67 per cent of auditors in the higher fraud risk condition did not generate any fraud hypotheses.

Additional analysis using one-way ANOVA revealed that subjects who generated fraud hypotheses made significantly higher likelihood assessments for fraud (means of 0.46 and 0.32 respectively; $p = 0.009$), but not higher likelihood assessments for error (means of 0.54 and 0.47 respectively; $p = 0.24$) than those who did not generate fraud hypotheses.[7] These results suggest that the propensity to generate fraud hypotheses is associated with a higher sensitivity to fraud risk.

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[6] Additional analyses indicate that the number of non-fraud misstatement hypotheses generated is not significantly affected by fraud risk.

H2a and H2b examine the impact of the availability of a non-misstatement management explanation on auditors' hypothesis generation performance. H2a predicts that auditors who receive a non-misstatement management explanation will generate fewer misstatement hypotheses than those who do not receive the management explanation. As indicated in Table 1, Panel B, the ANOVA main effect for the management representation treatment ($p = 0.945$) and the interaction between management representation and fraud risk ($p = 0.992$) are both not significant. The availability of a management explanation did not interfere with the generation of misstatement hypotheses. Hence, H2a is not supported.

H2b predicts that auditors who receive a non-misstatement management explanation will generate fewer fraud hypotheses than auditors who do not receive the management explanation. The results, presented in Panel B of Table 2, indicate that neither the number of fraud hypotheses generated nor the proportion of subjects generating fraud hypotheses are significantly affected by the availability of the management explanation. Similar results are obtained when the analyses are repeated for each level of fraud risk. Hence H2b is also not supported. In sum, the results for both H2a and H2b suggest that the management explanation did not interfere with auditors' generation of misstatement hypotheses in general, or fraud hypotheses in particular.

Additional Analyses

Prior work suggests that one way in which auditors' knowledge about misstatements are organized in long-term memory is by transaction cycle categories (Libby, 1985; Frederick *et al.*, 1994). Libby and Frederick (1990) found that when more experienced auditors were provided with a misstatement hypothesis from an unspecified source, they generated proportionately more misstatement hypotheses from the same transaction cycle as the inherited explanation. The typicality of the provided cue moderated this finding, with more hypotheses generated from the same cycle when the cue was less typical. This phenomenon, where 'activating a hypothesis in memory increases the speed of activation of related hypotheses' (Libby, 1985, p. 652), is called 'spreading activation' in the psychology literature (e.g., Collins and Loftus, 1975). We explore whether the availability of a non-misstatement management explanation affects the generation of misstatement or fraud hypotheses from the same transaction cycle as the management explanation (i.e., the sales cycle) in a similar manner. The results are generally consistent with Libby and Frederick (1990). Specifically, the ANOVA results (not presented) indicate that auditors who received the management explanation generated a higher proportion of misstatement hypotheses from the same transaction cycle as the management explanation than auditors who did not receive the management explanation (means of 0.48 and 0.34 respectively; $p = 0.024$).[8] Further, a significantly higher proportion of auditors who received the management representation generated fraud hypotheses from the sales cycle than those who did not receive the management explanation (100 per cent and 50 per cent respectively; $p = 0.04$ based on Fisher's Exact test). These findings suggest that the receipt of a non-misstatement management explanation from a specific transaction cycle facilitates auditors' retrieval of misstatement hypotheses from similar transaction cycles.

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[7] Non-parametric Mann-Whitney tests yield similar results.

Finally, to examine whether auditors' propensity to generate fraud hypotheses is associated with their general or domain-specific experience (e.g., Bonner and Lewis, 1990; Libby and Frederick, 1990), various measures of general and domain-specific experience were analysed for subjects who generated fraud hypotheses and those who did not. These experience measures were elicited in the debriefing questionnaire. General experience was measured by number of months of audit experience both generally and in the manufacturing industry specifically. Domain-specific experience in analytical procedures was measured by subjects' self-rated level of responsibility (based on the average response to four questions measured on a seven-point Likert scale) and level of ability (based on average response to two questions measured on a seven-point Likert scale) in the area of analytical procedures. Subjects were also asked about their prior experience in fraud detection by indicating whether they have encountered fraud in their audit career, both generally and in the manufacturing industry specifically.[9] The results of both parametric and non-parametric tests indicate that none of the experience measures are significantly different between the subjects generating and not generating fraud hypotheses. These results are consistent with the argument that there is little or no opportunity for expertise in fraud detection to develop, given that fraud detection occurs relatively infrequently in the life of an auditor (Loebbecke *et al.*, 1989; Johnson *et al.*, 1993).

DISCUSSION

This experiment examines the effects of fraud risk and the availability of a non-misstatement management explanation on auditors' hypothesis generation performance in analytical procedures. The results indicate that although auditors in the higher fraud risk condition did not generate significantly more misstatement hypotheses than auditors in the lower fraud risk condition, they exhibited a significantly greater propensity to generate hypotheses about fraud. This finding underscores the importance of distinguishing between fraud and non-fraud misstatement hypotheses and suggests that auditors' sensitivity to fraud risk is reflected through generation of more fraud hypotheses. However, the result also suggests that auditors do not readily generate fraud hypotheses since only 33 per cent of the subjects in the higher fraud risk condition generated fraud hypotheses, even when explicitly asked to generate misstatement hypotheses. Auditors who generated fraud hypotheses were found to be more sensitive to fraud risk, by making higher likelihood assessments for fraud, than those who did not generate fraud hypotheses. To the extent that the generation of appropriate hypotheses and adequate sensitivity to fraud risk contribute towards greater effectiveness in fraud detection, future research could profitably investigate how auditors' performance in hypothesis generation, in particular the generation of fraud hypotheses, can be improved to achieve greater audit effectiveness.

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[8] Consistent with Libby and Frederick (1990), the proportion of misstatement hypotheses generated from the sales cycle (to which the management explanation belongs) was computed for each subject and the 2 × 2 ANOVA was performed on the proportions after applying the arcsin-square-root transformation (Press, 1972). Only subjects who generated two or more plausible hypotheses are included in the analysis, as the proportions would be undefined for subjects who generated zero plausible hypotheses, and the distributions would be highly non-normal for subjects who generated one plausible hypothesis. This screening eliminated four, one, two and two subjects in treatments 1, 2, 3 and 4 respectively.

[9] Only 17 per cent (6 per cent) of the subjects reported having ever encountered fraud (fraud in the manufacturing industry).

Although prior research has raised concerns about the potential interference effects of non-misstatement management explanations on auditors' generation of alternative misstatement hypotheses (e.g., Kinney and Haynes, 1990; Anderson *et al.*, 1992), the results reproduced here indicate that the availability of a non-misstatement management explanation did not affect either the number of misstatement hypotheses generated nor the auditors' propensity to generate fraud hypotheses. Instead, auditors who received the non-misstatement explanation from the client management had placed more emphasis on generating more misstatement hypotheses (as well as fraud hypotheses) from the same transaction cycle as the provided explanation. These results are reassuring since the ability of management explanations to interfere with auditors' hypothesis generation performance could potentially undermine audit effectiveness, especially when fraud risk is high.

As mentioned earlier, here subjects were only asked to generate misstatement hypotheses due to the need to control for potentially confounding effects of non-misstatement hypotheses. This may have caused the subjects to be more sensitive to the risk of misstatements than they normally would be in practice. However, it should be noted that the subjects' likelihood assessments for fraud and error are not unduly high across all experimental conditions (means of 0.35 and 0.49 respectively), suggesting that over-sensitization to fraud risk is not a major problem. Further, the present finding that the non-misstatement management explanation did not interfere with auditors' hypothesis generation performance is corroborated by another study that used a different task setting where subjects generated both misstatement and non-misstatement hypotheses (see Green and Trotman, 1999),[10] suggesting that former results are not driven by our choice of task design. Nevertheless, future research could determine whether the reported results are robust to alternative task designs.

Finally, this study has only examined one aspect of the auditor judgment process involved in analytical procedures, namely the hypothesis generation stage. Given that analytical procedures involve a sequential and iterative process comprising the various stages of mental representation, hypothesis generation, information search and hypotheses evaluation, future research could investigate whether the reported results persist through the other stages of analytical procedures, or are affected by other activities in the audit (such as the review process). For example, future research could determine whether and how the generation of fraud hypotheses affect the nature and extent of audit planning decisions.

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[10] Their study examines different issues from the current study (i.e., the effects of the timing and source of inherited explanations rather than the effects of fraud risk).

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CHONG M. LAU AND CHRISTEN BUCKLAND

Budgeting—the Role of Trust and Participation: A Research Note

Prior studies have found a combination of an evaluative style with high budget emphasis and high participation to be associated with better behavioural outcomes (e.g., lower job-related tension) than all other combinations of budget emphasis and participation. Yet there has been little research to investigate the theory on why this particular combination of budget emphasis and participation is associated with better behavioural outcomes. A path analytical model, which investigates the intervening effects of trust and participation on the relationship between budget emphasis and job-related tension, was used. Senior Norwegian managers were selected as subjects for this study. The results indicate that budget emphasis has an insignificant direct effect on job-related tension but a strong indirect effect through trust and participation. Trust also has an intervening effect on the relationship between budgetary participation and job-related tension. It is therefore possible to conclude that high budget emphasis is associated with high budgetary participation and high trust. High trust, in turn, is associated with reduced subordinates' job-related tension.

Key words: Budgeting; Participation; Trust

The impact of performance evaluative styles on subordinates' attitudes and performance has been the focus of much management accounting research (Briers and Hirst, 1990; Lindsay and Ehrenberg, 1993; Hartmann and Moers, 1999; Otley and Fakiolas, 2000; Hartmann, 2000). The first systematic work in this area by Hopwood (1972) indicated that an inflexible approach in the use of accounting data to evaluate subordinates' performance was associated with subordinates' job-related tension and other dysfunctional behaviour. Otley (1978), however, was unable to replicate these results. Since then, a stream of studies has examined a variety of variables which could influence the relationships between performance evaluative styles and a variety of behavioural outcome variables (e.g., Brownell, 1982; Hirst, 1983; Govindarajan, 1984; Mia, 1989; Harrison, 1990, 1992, 1993; Ross, 1994). While there have been suggestions that the overall results are not well organized, due to the differences in the measurement and conceptualization of reliance on accounting performance measures (Otley and Fakiolas, 2000; Hartmann, 2000), and the improper use of methods in some studies (Shields and Young, 1993; Shields and Shields,

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1998; Hartmann and Moers, 1999), the large body of evidence accumulated has nevertheless provided some understanding and general patterns of relationships which may assist in the further development of theory and empirical testing (Otley and Fakiolas, 2000; Hartmann, 2000).

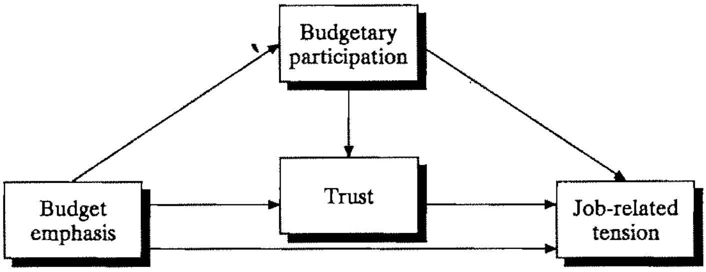
In particular, a relatively consistent pattern has emerged with respect to the effects of high budgetary participation. Brownell (1982) argued that for beneficial behavioural consequences to occur, an evaluative style with a heavy reliance on accounting performance measures (RAPM or budget emphasis) should be complemented with a high extent of budgetary participation. His results indicated that a match of a high budget emphasis and high participation was associated with high managerial performance. Since then, a number of studies have found relatively consistent results with this particular combination of budget emphasis and participation on a variety of behavioural outcomes in different environments. These include Brownell and Hirst (1986) in task uncertainty situations for job-related tension; Brownell and Dunk (1991) in task difficulty situations for managerial performance; Harrison (1992) in Australia and Singapore for job satisfaction and job-related tension; Dunk (1993) in Australia for budgetary slack; Lau *et al.* (1995) in Singapore for managerial performance; Lau and Tan (1998) in Australia and Singapore for the financial services sector managerial performance and Lau and Buckland (2000) in Norway for managerial performance.

While these works provide strong support for the expectation that a combination of high budget emphasis and high participation is associated with beneficial behavioural outcomes, the theory on why this combination is better (in terms of favourable behavioural outcomes) than other combinations of budget emphasis and participation remains undeveloped. This study proposes that the high extent of trust brought about by high budget emphasis and high budgetary participation may be responsible for the favourable subordinates' behavioural outcomes. High budget emphasis and high budgetary participation are likely to be associated with high trust. High trust, in turn, is likely to be associated with favourable behavioural outcomes. The positive association between participation and trust has been suggested by some researchers (e.g., Meadow *et al.*, 1959; Read, 1962; Parloff and Handlon, 1966). With budget emphasis, both Ross (1994) and Hartmann (2000) suggest that it may be linked to the subordinates' trust in their superiors.

Figure 1 illustrates the model to be used here. It permits the effects of both trust and budgetary participation on the relationship between budget emphasis and job-related tension to be integrated in a single model. This allows Brownell's (1982) work to be combined with that of Ross (1994). While examining the combined effects of budget emphasis and participation, Brownell had overlooked the intervening effect of trust. Similarly, while examining the effects of trust, Ross overlooked the effects of participation. The model in this study incorporates the effects of both of these variables. The results may provide valuable insights into the role of trust to explain why a combination of high budget emphasis and high participation is associated with functional behaviour, and in this study, reduced job-related tension. Job-related tension is studied here because it is likely to be related to dysfunctional behaviour (Hopwood, 1972; Ross, 1994) and performance (Jamal, 1985; Harrison,

FIGURE 1

PATH ANALYTICAL MODEL



1992). Moreover, Hartmann (2000) suggests that job-related tension is the more appropriate dependent variable than managerial performance in studies on evaluative styles. According to him, role theory has been the basic theoretical framework used in this research area and 'role theory typically points to such interpersonal and work-related factors as job-related tension and job satisfaction.' (Hartmann, 2000, p. 467).

Finally, the model in Figure 1 also allows the relationship between budgetary participation and job-related tension to be investigated. Prior works have suggested that budgetary participation is an important predictor of subordinates' behaviour and attitudes (e.g., Milani, 1975; Kenis, 1979). However, according to Chenhall and Brownell (1988), reported results are fraught with inconsistencies partly because of the failure of prior studies to consider the possibility that the effects of participation may be 'indirect and are conveyed to outcome criteria via some intervening constructs which links the variables.' (pp. 225–6). They found role ambiguity to be an important intervening variable and concluded that 'it is possible, indeed likely, that other variables can add to the explanation of the indirect path between participation and criteria' (p. 232). This study investigates another plausible intervening variable, namely, trust, and the extent to which it mediates the relationship between participation and subordinates' attitudes.

THEORETICAL DEVELOPMENT

Budget Emphasis and Job-Related Tension

A significant development in the literature concerning the impact of accounting data on subordinates' attitudes was Hopwood's (1972) and Otley's (1978) systematic examinations of the impact of supervisory evaluative styles. They both suggested that supervisory evaluative styles may be directly associated with subordinates' attitudes and behaviour, including job-related tension. Hopwood's results indicated that supervisory evaluative style was significantly associated with job-related tension. The proposed model for this study in Figure 1 indicates that these relationships may be indirect via trust and participation. The theoretical support for this expectation is provided below.

Budget Emphasis and Trust

Prior studies, which have investigated the relationships between evaluative styles and trust, have generally conceptualized trust as the trust the subordinates have in their superiors, that is, interpersonal trust (Hopwood, 1972; Otley, 1978; Ross, 1994). Hopwood (1972, p. 163) conceptualized trust as 'trust in supervisor', being regarded as one of the subdimensions of 'relations with supervisors'. Otley (1978) conceptualized trust similarly as 'interpersonal trust' which he regarded as 'trust in superior' and 'the trust a manager felt he had in his group manager' (p. 129). Ross (1994) had a similar concept of trust—'trust between organization members', 'trust between subordinate – superior pairs', 'trust between colleagues' and 'trust that (subordinates) have in their superiors' (pp. 629–30).

Consistent with the literature, trust is conceptualized here as the trust subordinates have in their superiors and is defined as the firm belief or confidence the subordinates have in the justice of their superiors. This concept is similar to that of Zand (1972), whose instrument was used in this study to measure trust. He (p. 230) defined trust as 'the conscious regulation of one's dependence on another'.

Performance evaluation is usually undertaken to motivate subordinates to improve performance. For this reason, performance evaluation is often linked to the reward systems with the subordinates' remunerations and promotions dependent upon their supervisors' evaluations of their performance. Consequently, subordinates usually attach great importance to these evaluations. Performance evaluations are dictated by the evaluative styles chosen and used by the superiors. Hence, subordinates are likely to regard their performance evaluations, the evaluative styles, as well as their superiors who choose and use the evaluative styles, as intricately linked. Consequently, they are likely to be unable to isolate their feeling toward the actual performance evaluations and evaluative styles, from their feeling toward their superiors. This means that if the subordinates do not trust the evaluative styles chosen and used to evaluate their performance, they are also likely to extend such feeling of mistrust toward their superiors who choose and use those evaluative styles. Moreover, subordinates' disagreement with the evaluative styles, and consequently the evaluations themselves, are likely to be a source of conflict and suspicion among the subordinates, their supervisors and other organizational members. Hopwood (1972, p. 162) suggested that subordinates who disagree with their supervisors' evaluations of their performance are likely to direct their dissatisfaction at their supervisors 'whose styles of evaluation pose such a threat to their security'. As mentioned earlier, his results indicated that evaluative styles were significantly related to the subordinates' relations with their supervisors and interpersonal trust. Otley (1978) similarly found that evaluative styles were significantly related to interpersonal trust. In conclusion, subordinates who trust their superiors' evaluations of their performance are likely to have greater trust in their superiors than those subordinates who distrust their superiors' evaluative styles and evaluations.

It is proposed here that the relationship between budget emphasis and the subordinates' trust in their superiors is a positive one. According to Ross (1994), subordinates are likely to be suspicious and apprehensive of a *nonaccounting* evaluative style. Such a style is described as difficult to interpret as 'the criteria associated with the nonaccounting performance evaluation style are somewhat subjective and therefore, may well be ambiguous and difficult to measure' and are subject to 'a superior's biases and idiosyncrasies' (p. 630). Further, it was suggested that subordinates 'may always have a nagging doubt as to the reasonableness of an evaluation based on subjective criteria . . . The managers may, therefore, feel a lack of control over their ability to affect their evaluation.' In contrast, evaluative styles based on accounting performance measures are likely to be much more acceptable to subordinates because such criteria were described by Ross (1994) as much more 'objective' and 'verifiable' than nonaccounting criteria. This means that nonaccounting evaluative styles are likely to be associated with greater mistrust in superiors than accounting-based evaluative styles.

Empirically, Hopwood (1972, p. 173) found that the subordinates' trust in their superiors was positively associated with the two criteria of 'meeting the budget' and 'concern with costs', the two items he used to measure accounting-based criteria. It was suggested that 'this might reflect the fact that one purpose of a budget is to clearly set out the objectives for a cost centre. While this certainly cannot be done with perfect accuracy, it is possible to carefully and cautiously use the budget for this purpose and thereby add an important element of structure and clarity to the job environment.' And further:

> A nonaccounting evaluation, in particular, might be made on the basis of rather vague criteria: attitudes, the way the cost centre head handles his men, and effort. Whilst such criteria are important, they are surrounded by a great deal of uncertainty. It is difficult to clearly specify what constitutes good and bad performance, and a supervisor might find it difficult to determine when improvement occurs. In these circumstances, the budgetary systems offer one definite advantage. It attempts to express the unit's objectives in a precise manner. (p. 174)

The above discussion therefore supports the proposition that a high budget emphasis evaluative style is likely to be associated with a high subordinate's trust in superior.

Trust and Job-Related Tension

Trust in superior is likely to be an important variable affecting job-related tension. Zand (1972, p. 230) defines trusting behaviour as 'actions that (a) increase one's vulnerability, (b) to another whose behaviour is not under one's control, (c) in a situation in which the penalty (disutility) one suffers if the other abuses that vulnerability is greater than the benefit (utility) one gains if the other does not abuse the vulnerability'. Accordingly, when the subordinates' trust in their superiors is low the subordinates are likely to be less open with their superiors. They learn to bottle up their feelings and not to express them openly. Since mistrust is likely to flow both ways, superiors are also likely to be secretive and be less transparent in their dealings with their subordinates in such a low trust environment. This implies that a low trust environment is not conducive to greater transparency and openness. Such a strained working environment is likely to lead to a high extent of anxiety, stress and frustration, all of which are likely to lead to high job-related tension. In contrast, when the subordinates' trust in their superiors is high, the subordinates and their superiors are likely to be more open with each other. Both parties are likely to be more willing to express their feelings and air their concerns and grievances openly. Additionally, compromises and consensus of opinions are also likely to be more common than when the subordinates' trust in their superiors is low. All these reduce stress, frustration and conflicts, leading to lower job-related tension. In conclusion, it is likely that the subordinates' trust in their superiors is negatively associated with job-related tension.

The discussion above suggests that budget emphasis may be related to job-related tension. However, budget emphasis may also be positively related to trust. Trust, in turn, may be negatively related to job-related tension. These discussions therefore support the existence of an indirect effect of budget emphasis on job-related tension through trust. Accordingly, the following hypothesis is tested:

H1: Budget emphasis has an indirect effect on job-related tension through trust.

Budget Emphasis and Participation

In addition to trust, budgetary participation is also likely be an intervening variable in the relationship between budget emphasis and job-related tension. Prior studies suggest that budgetary participation is important to subordinates who are evaluated by a high budget emphasis evaluative style (Becker and Green, 1960; Brownell, 1982, Brownell and Hirst, 1986). Since a high budget emphasis evaluative style links the subordinates' rewards to the achievement of their budget targets, the levels of budget targets are therefore important to them. Hence, they are likely to be interested in and want to participate in the budget setting process. Consequently, they are likely to exert greater pressure on their superiors to accord them higher budgetary participation privileges than subordinates who are evaluated by a low budget emphasis evaluative style. This means that high (low) budget emphasis is likely to be associated with high (low) budgetary participation. Empirically, Lau and Buckland (2000) found a highly significant positive relationship between budget emphasis and participation. The above discussion therefore suggests a positive relationship between budget emphasis and budgetary participation.

Budgetary Participation and Job-Related Tension

Budgetary participation benefits subordinates in a number of ways. It enables them to understand the budget target setting process better. It also allows them to ensure budget adequacy (Nouri and Parker, 1998). Additionally, subordinates may also seek and exchange information with their superiors about their task's completion. Brownell and Hirst (1986, p. 242) suggested that high budgetary participation enables subordinates to 'gain access to resources which can be used to buffer task performance from the unanticipated effects of others, and to introduce new and better means of addressing tasks, which, if highly uncertain, will have characteristics that change over time'. Both Becker and Green (1960) and Kren and Liao (1988) suggested that budgetary participation may foster group cohesiveness and the sharing of information. All these benefits are likely to reduce the extent of anxiety faced by subordinates. High budgetary participation is therefore likely to be associated with lower subordinates' job-related tension.

In summary, based on the discussion above, budget emphasis is expected to be positively related to budgetary participation. Budgetary participation, in turn, is expected to be negatively related to job-related tension. These relationships therefore suggest that the effect of budget emphasis on job-related tension may be indirect through participation. The following hypothesis is therefore tested:

H2: Budget emphasis has an indirect effect on job-related tension through budgetary participation.

Budgetary Participation and Trust

Budgetary participation is likely to promote a high degree of trust that the subordinates have in their superiors. It opens up the budget target setting process for the subordinates' scrutiny, thereby making the process transparent. Subordinates are also likely to accept those budget targets which they help set more than those imposed on them by others. Such acceptance may lower the subordinates' mistrust of their superiors' evaluative styles and, ultimately, their superiors who choose and use the evaluative styles and carry out the evaluations. Consequently, superiors who allow their subordinates to participate in the budget setting process are likely to foster greater trust between themselves and their subordinates than superiors who adopt a less participatory approach. This suggests a positive association between budgetary participation and trust. Empirically, Otley (1978) investigated the link between budgetary participation and trust in superior and found the results to be positive and significant.

As discussed above, budgetary participation is expected to be negatively related to job-related tension. Since the above section indicates that budgetary participation is also expected to be positively related to trust, and trust, in turn, may be negatively related to job-related tension, arguably the effect of budgetary participation on job-related tension may be partially mediated by the intervening effect of trust. Accordingly, the following hypothesis is tested:

H3: Budget participation has an indirect effect on job-related tension through trust.

METHOD

A questionnaire survey was used to collect data to test the three hypotheses. Manufacturing organizations were selected for study, as the use of budgets in such organizations is common. One hundred manufacturing organizations were selected randomly from Kompass Norway, 1998. Only organizations with more than a hundred employees were selected so as to provide some control over the size of organizations. Three functional heads from different functional areas were selected from each organization to ensure that the results would be generalizable across functional areas. The use of random sampling and the selection of 300 respondents in this study assisted to address two of the common methodology flaws identified by Hartmann (2000, p. 469) in some prior studies. In his review of the RAPM literature, he found that non-random samples and 'sample sizes below 50 are typical rather than exception'. According to him, the use of small sample sizes, when complex statistical models are needed to analyse the data, may be a cause for the lack of consistent and replicated findings across studies in this research area.

A questionnaire, together with a prepaid return addressed envelope and a covering letter explaining the objectives of the research, was mailed to each of the 300 selected respondents. As the measurement instruments used to measure the variables examined in this study were developed in English and as English is not widely used in Norway, it was necessary for the questionnaire to be translated into Norwegian. The translation process involved three separate steps. First, one of the researchers, who is a Norwegian national, translated the questionnaire from English into Norwegian. Second, a university professor, who is also a Norwegian national, translated the Norwegian version of the questionnaire back into English. The last step involved a cross-check of the latter English version with the original English version to ensure that the translation was accurately done. Only the Norwegian version of the questionnaire was used. A follow-up by telephone was undertaken three weeks after the date the questionnaires were mailed.

A total of 132 questionnaires were returned, yielding a response rate of 44 per cent. Out of the 132 returned questionnaires, twelve responses were excluded from the study as the respondents had failed to complete the questionnaire fully. This left the study with 120 usable responses. The nonresponse bias tests suggested by Oppenheim (1966) indicated that there were no significant differences between early and late responses. Hence, nonresponse bias was assumed to be not present. The demographic data indicated that, on average, the respondents had held their current positions for 5.4 years and had a mean of twelve years of experience in their present areas of responsibility. They had a mean of 185 employees in their areas of responsibility.

MEASUREMENT INSTRUMENTS

Budget emphasis Budget emphasis was measured by a modified version of Hopwood's (1972) instrument. A seven-point scale, which allowed the items to be rated instead of being ranked, was used. The rating form allowed the evaluative styles to be measured as a continuum (Otley, 1978; Govindarajan, 1984; Brownell and Dunk, 1991; Harrison, 1992).

Hopwood's two original items, 'concern with costs' and 'meeting the budget', were intended to measure reliance on short term and long term accounting performance measures. A concern of Otley and Fakiolas (2000, p. 506) with some prior studies, which had adopted Hopwood's original instrument without amendment, was the inappropriate terminology of this instrument in some situations because this instrument was designed by Hopwood to reflect the terminology in use within the particular organization he studied. In order to ensure that the terminology of the instrument has wider applicability in surveys of more than a single organization, Harrison (1992) amended the two key items to 'My ability to meet budgeted targets in the short run' and 'My long run concern with cost and/or revenues'. As these modified items seemed to have wider application than Hopwood's original items because they are applicable not only to cost centres but also to revenue centres and profit centres, these modified items were used in this study. Consistent with a number of studies in this research area (e.g., Brownell, 1985, 1987; Dunk, 1989a, 1989b; Brownell and Dunk, 1991; Harrison, 1992, 1993; Lau *et al.*, 1995; Lau and Tan, 1998), these two items were summed to derive a score for budget emphasis, with high (low) scores denoting high (low) budget emphasis. The correlation between the two items was 0.298 ($p < 0.01$).

Budgetary participation Budgetary participation was measured by the six-item Milani (1975) instrument. This instrument has been used in many prior studies (Brownell, 1982; Brownell and Hirst, 1986; Brownell and Dunk, 1991; Harrison, 1992; Lau *et al.*, 1995; Nouri and Parker, 1998) and has consistently shown high internal reliability in terms of Cronbach alpha values. For this study, a Cronbach alpha value of 0.79 was obtained. A factor analysis indicated that all items loaded satisfactorily on factor 1 (eigenvalue = 2.981; variance explained = 49.69 per cent) except for item 2 (What is the extent of the reasoning given by your superior for revision to your budget?), which loaded on factor 2. However, as item 2 also has a relatively high factor loading of 0.584 on factor 1, it was included with the other five items as the measure for budgetary participation.[1]

Trust Trust was measured by a four-item seven-point instrument developed by Zand (1972).[2] Zand developed this four item instrument to induce a mental set toward high trust among his respondents comprising upper-middle managers.[3] According to Zand (1972, p. 233), trust, in relation to this instrument, is regarded 'not [as] a personality variable, that is, an element of individual character, but as an induced attitude, one that the individual could alter in a situation in which he was led to intend and to expect trust (or mistrust) from others.' This instrument was appropriate here, as trust was also not regarded as a personality variable but an induced mental state. Subordinates' trust in their superiors was expected here to be induced by the subordinates' agreement and favourable reaction to the

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[1] Brownell (1982) had similarly included item 2 with the other five items even though item 2 had a factor loading of only 0.091 on factor 1 in his study.

[2] The four items are: (1) 'You have learned from your experience during the past two years that you can trust the other members of top management'; (2) 'You and other top managers openly express your differences and your feelings of encouragement or disappointment'; (3) 'You and the others share all relevant information and freely explore ideas and feeling that may be in or out of your defined responsibility'; and (4) 'The result has been a high level of give and take and mutual confidence in each other's support and ability'.

[3] Zand's (1972) work was involved with situations where superior and subordinate relationships existed. Hence, his instrument was used in this study to capture the trust that exists in superior and subordinate relationships. The items of the instrument refer to 'top management' and 'top managers'. These terms indicate to the respondents that the questions refer to senior management, including their superiors. Hence, responses to these items would include the subordinates' relationships with their superiors.

Table 1

DESCRIPTIVE STATISTICS AND CRONBACH ALPHA

Variables	Mean	Median	SD	Theoretical range Min.	Theoretical range Max.	Actual range Min.	Actual range Max.	Cronbach alpha
Budget emphasis	11.37	12	1.878	2	14	5	14	n/a
Participation	36.42	38	4.630	6	42	14	42	0.79
Trust	21.86	23	4.193	4	28	4	28	0.86
Job tension	34.12	33	10.901	14	98	14	74	0.89

superiors' evaluative styles and, as discussed earlier, ultimately by the overall reward system.

The alpha Cronbach value of 0.84 obtained for this study indicated high internal consistency for the instrument. A factor analysis also indicated that all four items loaded strongly (minimum of 0.735) on a single factor with an eigenvalue of 2.71 and explained 67.8 per cent of the variance.

Job-related tension Job-related tension was measured by the Job-Related Tension index (Kahn *et al.*, 1964) developed by the Institute for Social Research at the University of Michigan. This index has fifteen items, and a seven-point scale, and measures an individual's feelings towards his/her working environment. It had been used extensively by prior studies (e.g., Hopwood, 1972; Otley, 1978; Bottger and Hirst, 1988; Hirst, 1983; Brownell and Hirst, 1986; Harrison, 1992).

Factor analysis of the fifteen items indicated four underlying factors, but with one predominant factor (Factor 1) which has an eigenvalue of 6.07 and accounting for 40.47 per cent of the variance. All items loaded above 0.5 on this first factor except for item 9 (Have to decide things that affect the lives of individuals, people you work with?) and item 15 (Feeling that your job tends to interfere with your family life?). As item 9 has a factor loading of only 0.34 on Factor 1, it was dropped from Factor 1. Item 15 has a factor loading of 0.483 in Factor 1. As this is only slightly below 0.5, this item was included with the other thirteen items in Factor 1 as the measure of job-related tension. Consequently, a single fourteen-item instrument was used with the job-related tension scores derived by summing the scores of these fourteen items. The results of the hypothesis tests undertaken later indicated that there were no statistical differences in the results regardless of whether job-related tension was measured by the fourteen items or by all the original fifteen items. Finally, the Cronbach alpha value of 0.89 obtained in this study for the fourteen items indicates strong internal consistency for this instrument.

Table 1 presents the descriptive statistics of the variables examined in this study.

RESULTS AND DISCUSSION

The main relationships tested involve indirect and intervening effects. Path analysis is the appropriate technique for investigating these effects. In addition, all variables

TABLE 2

ZERO-ORDER CORRELATIONS AMONG VARIABLES

	Participation	Trust	Job-related tension
Budget emphasis	0.341*	0.399*	–0.303*
Participation		0.291*	–0.375*
Trust			–0.495*

* $p < 0.01$.

TABLE 3

PATH ANALYSIS RESULTS

Dependent variable	Independent variables	Path coefficients	*t*-value	*p*-value
BP	BE	0.341	3.945	0.001
Trust	BE	0.339	3.827	0.001
	BP	0.175	1.973	0.051
JRT	BE	–0.062	–0.708	0.481
	BP	–0.237	–2.840	0.005
	Trust	–0.401	–4.682	0.001

were measured on an interval scale. This satisfies the requirements of path analysis.[4] Consequently, path analysis is used to analyse the data. This technique has been used extensively in management accounting research (e.g., Hayes, 1977; Brownell and McInnes, 1986; Chenhall and Brownell, 1988; Nouri and Parker, 1998).

H1 and H2 (Indirect Effect of Budget Emphasis via Trust and Participation)

The zero-order correlations between the variables examined are presented in Table 2. The results indicate that the correlations between the variables are all significant ($p < 0.01$). In particular, they indicate that budget emphasis is significantly associated with job-related tension ($r = -0.303$; $p < 0.01$).

H1 states that there is an indirect relationship between budget emphasis and job-related tension through trust, and H2 states that there is an indirect relationship between budget emphasis and job-related tension through participation. The indirect effects of budget emphasis on job-related tension consist of the following paths and are calculated based on the values of the path coefficients in Table 3:

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[4] Tests were also undertaken to ensure that the inherent assumptions of the regression models were satisfied. These included testing for the normality of residuals, homogeneity of variance of residuals and the appropriateness of the linear models. The normal probability plots of the residuals indicate that the normal probability plots approximated straight lines. The plots of the residual against the corresponding fitted (predicted) values for the models used indicate that all plots fall within approximately equal horizontal bands with no discernible patterns or systematic variations. Hence, the assumption of the homogeneity of variance of residuals and the appropriateness of the linear models were not violated.

Table 4

DECOMPOSITION OF OBSERVED CORRELATIONS

Relations	Observed correlation	Direct effect	Indirect effect	Spurious effect
BE/JRT	−0.303**	−0.062	−0.241	
BE/BP	+0.341**	+0.341**		
BP/Trust	+0.291**	+0.175*		+0.116
BE/Trust	+0.399**	+0.339**	+0.060	
Trust/JRT	−0.495**	−0.401**		−0.094
BP/JRT	−0.375**	−0.237**	−0.070	−0.068

** $p < 0.01$.
* $p < 0.10$.

Path (1)	BE – BP – JRT	0.341 × −0.237	−0.081
Path (2)	BE – BP – TR – JRT	0.341 × 0.175 × −0.401	−0.024
Path (3)	BE – TR – JRT	0.339 × −0.401	−0.136
Total indirect effect			−0.241

Path (1) indicates the indirect effect exclusively via budgetary participation, which is −0.081. Paths (2) and (3) indicate the indirect effect through trust, which is −0.16. These results show that the relationship between budget emphasis and job-related tension comprises two effects. First, there is a direct effect of −0.062 (see Table 3). Second, there is an indirect effect of −0.241, which can be further decomposed into the portion attributable to participation (−0.081) and the portion attributable to trust (−0.16). According to Bartol (1983, p. 809), an indirect effect in excess of an absolute amount of 0.05 may be considered meaningful.

Table 4 presents a summary of the decomposition of the zero-order correlations into the direct effects, indirect effects and spurious effects. In order to ascertain if a full or partial mediation occurs, the criterion suggested by Baron and Kenny (1986) was used. According to them, a full mediation occurs if a significant relationship (i.e. a significant zero order correlation) between the independent variable (budget emphasis) and the dependent variable (job-related tension) becomes insignificant (i.e., an insignificant path coefficient) after controlling for the effect of the intervening variables. In other words, if the zero order correlation between the independent variable and the dependent variable is significant, and the path coefficient is not significant, then a full mediation is deemed to have occurred. In contrast, a partial mediation is deemed to have occurred if the relationship between the independent variable and the dependent variable is still significant, after controlling for the effects of the intervening variables. For this study, the relationship between budget emphasis and job-related tension is significant ($r = -0.303$; $p < 0.01$, in Table 2). However, after controlling for the indirect effects via participation (−0.081) and trust (−0.16), the path coefficient between budget emphasis and job-related tension is not significant (−0.062; $p < 0.481$, Table 3). This means that participation and trust mediate fully the relationship between budget emphasis and job-related tension. Based on these results, H1 and H2 are both supported.

H3 (Indirect Effect of Participation on Job-Related Tension via Trust)

H3 states that there is an indirect relationship between budgetary participation and job-related tension through trust. The indirect effect and the spurious effect consist of the following paths and are computed based on the values of the path coefficients in Table 3:

Path (4)	BP – TR – JRT	0.175 × –0.401	= –0.0701
Path (5)	BP – BE – JRT	0.341 × –0.062	= –0.0211
Path (6)	BP – BE – TR – JRT	0.341 × 0.339 × –0.401	= –0.0464
			0.1376

Path (4) indicates the indirect effect exclusively via trust is –0.07. Paths (5) and (6) indicate a total spurious effect of –0.068. As the indirect effect via trust is in excess of an absolute amount of 0.05 (Bartol, 1983), H3 is supported.

Note, however, that only a partial mediation has occurred as the zero-order correlation between budgetary participation and job-related tension (–0.375) remains significant (–0.237) after controlling for the mediating and spurious effects. This means that apart from an indirect effect via trust, participation itself also has a negative and significant direct effect on job-related tension.

Other Results

Table 1 indicates that the job-related tension scores have an actual range of 60 versus the theoretical range of 84. The actual maximum of 74 is lower than the theoretical maximum of 98. Finally the actual mean score of 34 is also lower than the theoretical mean of 56. These statistics suggests that the range of the job-related tension scores is relatively low. In contrast, Table 1 indicates that the scores of the other variables are relatively high and skewed to the right. These results suggest that there is also restriction in the ranges of the variables' scores. Restriction in range could be due to the nature of the instruments used. For instance, with respect to job-related tension, we used the Job-Related Tension index developed by the Institute for Social Research at the University of Michigan. This instrument has a history of producing relatively low scores. Many prior studies, which used this instrument, have also reported mean job-related tension scores which were considerably below the theoretical means (e.g., Hopwood, 1972; Otley, 1978; Brownell and Hirst, 1986; Harrison, 1992; Ross, 1994; Lau *et al.*, 1995). Hence, there is considerable evidence to suggest that the low job-related tension data obtained in this study may be attributed to the inherent nature of the instrument.

From a statistical viewpoint, the occurrence of restriction in range is unlikely to affect the reliability and generalizability of the results of regression models. In their discussion on the restriction of range of the independent variables and/or the dependent variables in regression models, Cohen and Cohen (1983) concluded that the reliability of the regression coefficients is not affected by range restriction. They explained as follows:

> If the relationship is well described by a straight line and homoscedastic, we shall find that the variance of the *Y* scores about the regression line remains about the same. The regression coefficient will remain approximately the same because the decrease in *r* will

> be offset by an increase in the ratio sd_y/sd_x . . . The fact that B_{yx} tends to remain constant over changes in the variability of X is an important property of the regression coefficient . . . Therefore, it is important in any study to report the standard deviations of the variables used. Because . . . regression coefficients are not affected by range restriction, comparison of different samples using the same variables should usually be done on the regression coefficients, rather than on the correlation coefficients when standard deviations differ. (pp. 70–1)

Based on the above discussion and the results of the tests undertaken in this study, which indicate that the inherent assumptions of the regression models used were satisfied, the range restriction of the variables, as indicated in Table 1, is unlikely to affect the reliability and generalizability of our results. Consequently, the reported results are still meaningful and may have important implications for the design of management control systems.

Other Issues

Considering the large number of studies undertaken in this research area in different settings by many different researchers over several decades, it is not surprising to find a lack of unity in the theoretical frameworks used, theory presentations, conceptualization of variables and methodology in data collection and data analyses. Nevertheless, there have been concerns about these issues and the inconsistencies in results across studies (Hartmann and Moers, 1999; Otley and Pollanen, 2000; Otley and Fakiolas, 2000; Hartmann, 2000). In their review of studies involved with testing contingency hypotheses in budgetary research, Hartmann and Moers (1999) found that numerous studies, which had relied on the *moderated regression analysis* technique to test for interactive effects, did not apply proper methodology. As our study is concerned with intervening effects rather than interaction effects, we have used the path analytical technique rather than the moderated regression analysis technique. Consequently, the concerns expressed by Hartmann and Moers are generally not applicable to our study. Nevertheless, since the improper use of the moderated regression analysis techniques in some prior studies may have affected the interpretability and conclusions of these studies, comparison of our results with those of these earlier studies may be difficult.

With respect to the measurement and conceptualization of reliance on accounting performance measures (RAPM), the concern is generally not against the use of alternative approaches per se. In fact, Otley and Pollanen (2000, p. 495) suggested that the myriad concepts of RAPM used in different studies may indeed be useful as these different concepts 'may also be important explanatory variables' in explaining the effects of evaluative styles on subordinates' behaviour. Otley and Fakiolas (2000, p. 508) similarly suggested that RAPM is not a construct with a single dimension. Instead, there are different dimensions of RAPM. Based on their review of past studies, they identified different concepts of RAPM and regarded these as the important dimensions of evaluative style, which could be used in future RAPM studies. The concern is therefore not with the different concepts of RAPM, but rather with the confusion arising from the comparison of results among studies which used different concepts of RAPM.

Note that despite their concerns, these recent studies have found prior studies' results to be important and useful and are optimistic about future developments. Hartmann and Moers (1999, p. 309) concluded that 'the main implication for future research is that major advancement in this field can be made'. Otley and Pollanen (2000, p. 495) concluded that 'the stream of work that has emanated from Hopwood's seminal study has made an important contribution to understanding the roles that budgetary information can play in performance evaluation.' Hartmann (2000, p. 509) suggested that 'the current status and lack of organization of the RAPM research paradigm should be no reason for discouragement or abandonment'. Finally, Otley and Fakiolas (2000, p. 509) concluded as follows:

> But performance measurement and the use of performance measures in performance evaluation are still key management issues . . . the methods used in studies on RAPM and evaluative style appear to be generalizable into this arena with only relatively minor adaptation. The door is open for researchers to build upon this foundation and make a central contribution to the management accounting literature.

The present research therefore constitutes an attempt to continue and build on this important research area. It investigated the role of trust in addition to that of participation on the relationship between budget emphasis and job-related tension. The choice of job-related tension as the dependent variable is consistent with role theory, which according to Hartmann (2000) is the most commonly used theoretical framework for RAPM studies. With respect to methodological issues, the path analytical technique was used rather than the moderated regression analysis technique, random sampling was applied and a relatively large sample of 120 usable responses was obtained. These approaches have assisted in avoiding the methodological flaws identified by Hartmann (2000).

Consistent with most studies in this research area, this study has relied on Hopwood's instrument for measuring budget emphasis. In order to address the concern of Otley and Fakiolas that the terminology in Hopwood's instrument may not be applicable to all situations, we adopted the version of the instrument as amended by Harrison (1992) for surveys of a number of organizations. While Hopwood's original version is applicable only to cost centres, Harrison's version of the instrument is applicable not only to cost centres but also to revenue centres and profit centres.

Finally, the conceptualization of budget emphasis in this study is based on the absolute importance of accounting performance measures. This approach is in accordance with a number of other works (e.g., Brownell, 1985, 1987; Dunk, 1989a, 1989b; Brownell and Dunk, 1991; Lau *et al.*, 1995; Lau and Tan, 1998). In order to minimize the confusion associated with the different conceptualizations of budget emphasis, the reported results here should only be evaluated with those of studies which have conceptualized budget emphasis in a similar manner. Comparisons of the reported results with those of studies which had conceptualized budget emphasis differently should be undertaken only with caution.

CONCLUSIONS

This study incorporates the intervening effects of trust to that of participation on the relationship between budget emphasis and job-related tension. The results generally support the hypotheses developed and therefore provide additional evidence to assist in explaining the complex relationship between supervisory evaluative style and subordinates' behaviour. Together with the results of earlier work, they constitute a body of knowledge, which may have important theoretical and practical implications.

Hartmann (2000) and Otley and Fakiolas (2000) were both critical of the underdevelopment of the conceptualization and theory on the reliance on accounting performance measures (RAPM) in prior studies. However, both have nevertheless regarded the evidence collected in these studies to be useful in the further development of theory in this and related research areas. For instance, Otley and Fakiolas (2000, p. 508) suggest that prior studies do 'form a useful basis on which to develop an improved conceptualization of the concept of budget emphasis'. Hence, the present study may also assist in further theory development. First, it provides additional evidence to support the theory that a combination of high budget emphasis and high participation found by a number of prior studies (e.g., Brownell and Dunk, 1991; Lau *et al.*, 1995) may be associated with better behavioural outcomes than other combinations of budget emphasis and participation. Second, it provides valuable insights which help to explain why this combination of high budget emphasis and high participation is associated with better behavioural outcomes. Third, it also provides an empirically validated model which permits the effects of budget emphasis, participation and trust on job-related tension to be investigated simultaneously. Without such empirically validated models, it would be difficult to improve on theory development.

The present study incorporates the effects of trust. Trust has been regarded as an important variable for studying the effects of evaluative styles on subordinates' behaviour (Ross, 1994; Hartmann, 2000). According to Ross (1994), many researchers from the various disciplines are giving recognition to the concept that trust is an important factor in organizational behaviour. Hartmann (2000, p. 475) similarly identified trust as one of the crucial variables that might assist in the development of an RAPM theory that is based on the concept of uncertainty. Considering the importance and relevance of trust in management control systems, it is surprising that there have been so few systematic investigations on the role of trust in RAPM research. In particular, the importance of trust as an intervening variable and its effect on subordinates' behaviour have apparently been overlooked. This means that insofar as the effect of trust is concerned, RAPM theory development has been relying mainly on anecdotal evidence. The systematic evidence reported here would assist in improving this unsatisfactory situation.

There are also important practical implications. The results of this study may assist top management to better understand the importance of budget emphasis and budgetary participation in enhancing trust in their organizations. This will assist them to select the appropriate evaluative style and the level of budgetary participation that are associated with the enhancement of trust. The results may also assist them to appreciate the role and importance of trust in reducing their subordinate managers' job-related tension. As job-related tension may be related to dysfunctional behaviours and managerial performance, any measure undertaken by top management to reduce it may lead to improvements in their organizations' profitability. Second, while there has been much interest in recent years in the use of nonfinancial performance indicators for performance evaluation, for instance, in the Balanced Scorecard (Kaplan and Norton, 1996), corporate management should be aware of the possible implications of the switch away from accounting-based performance indicators. The results of this study suggest that a reduction in the extent of reliance on accounting based performance indicators may be associated with a reduction in trust in the organizations and, consequently, an increase in the subordinates' job-related tension. This may have adverse consequences for the organizations.

There are a number of limitations in this study. First, whilst Zand's (1972) instrument was used in his study in situations where subordinate and superior relationship existed, it is possible that it may also measure the level of trust between peer managers. Consequently, the replication of this study with other trust instruments would assist to verify the validity of Zand's instrument and add to the robustness of the theory and results of this study (Lindsay and Ehrenberg, 1993; Otley and Pollanen, 2000). Second, since this study was undertaken with a sample of senior managers drawn from the manufacturing sector, the results may not be generalized to managers at other management levels and to other sectors. Third, even though the survey method is a well-documented research methodology, the results of this study may, nevertheless, be affected by the usual limitations associated with this research method. Finally, while we have argued for the causal relationships for the model in Figure 1, these causal relationships between the variables may be more complex than proposed in our study. For instance, trust may affect superiors' evaluative style and the level of subordinates' participation in the budgetary process. Since a questionnaire survey method was used to collect the data, and since survey data involve only cross-sectional data collected at one point in time, the nature of the data and analysis therefore may not prove the causal direction between variables. Additional studies using other methods, such as laboratory experiments, may be needed to substantiate the findings of this study and to provide better evidence about causality.

Nevertheless, despite these limitations, the current research is important. According to Hartmann (2000, p. 477), 'RAPM studies address important and interesting phenomena, which are embedded in rich environmental, organizational, departmental and individual context. Such richness obviously hinders quick answers to quick research questions.' Since our study is the first systematic investigation on the intervening effect of trust in this research area, it may assist in enhancing further the richness of RAPM research and provide additional insights to resolve some of the complex relationships and issues in this traditional, but still important and interesting, research area.

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G. MEEKS AND J. G. MEEKS

The Loser's Curse: Accounting for the Transaction Costs of Takeover and the Distortion of Takeover Motives

Studies for major stock markets of share price movements in the period around a takeover show that target company shareholders typically experience large gains in wealth but that acquiring company shareholders do not. The reasons for this asymmetry—and, in particular, for the absence of gains for the shareholders of the companies which initiate the deal—are imperfectly understood. This note suggests one factor contributing to those results. It argues that accounting practice prescribed by the main standard setters is non-neutral towards 'successful' and 'unsuccessful' bidders with respect to reporting the transaction costs of bidding. It shows how the prescribed accounting treatment of these costs affects performance measures used in salary contracts as well as in the markets for executives and for corporate control. The result is that the managers of bidding companies will have an 'artificial' incentive to inflate their bid price or to go ahead with a bid which offers no benefit to their shareholders. Ironically, the main standard setters seem minded soon to prohibit the only accounting technique which does not distort these incentives.

Key words: Accounting; Gains; Losses; Poolings of interest; Purchase accounting (acquisitions); Takeover bids.

British and American studies of share price movements in the period up to a takeover show that target company shareholders typically experience large gains in wealth (of the order of 20–30 per cent) but that acquiring company shareholders on average experience little or no gain, and indeed suffer declines after the takeover (surveys include Jensen and Ruback, 1983; Jarrell *et al.*, 1988; Caves, 1989; Hughes, 1993; see also Agrawal *et al.*, 1992; Gregory, 1997). The reasons for this asymmetry—and, in particular, for the absence of gains for the shareholders of the companies which initiate the deal—are imperfectly understood. This note suggests one factor contributing to those results. It argues that standard accounting practice in many countries may distort the incentives facing bidders. This is because accounting

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standards are non-neutral towards 'successful' and 'unsuccessful' bidders[1] with respect to reporting the transaction costs of bidding. The accounting treatment of these costs (quantified below) depends on whether the bid is successful; and the disparate treatment means that, other things equal, standard performance measures will be depressed by these costs where bids are aborted—the 'losers's curse'—but not where the bid is completed. To the extent that the utility of bidding managers is linked to these performance measures (directly though salary contracts, indirectly through outsiders' perception of the firm, affecting job security), bidding managers who have committed sunk transaction costs to a bid will have an 'artificial' incentive to inflate their bid price or to go ahead with a bid which offers no benefit to their shareholders.

THE TRANSACTION COSTS OF TAKEOVER[2]

One significant component of transaction costs is underwriting commission, where the underwriter agrees to provide target company shareholders with cash in exchange for shares in the acquiring company. The commissions may total 2 per cent of the value of the bid; in some bids the percentage is reduced if the bid fails and increased if it succeeds (Gray and McDermott, 1990).

Advisory fees to merchant banks represent the second category of transaction cost. As there are indivisibilities in the supply of advisory services these fees increase as a proportion of bid value as the size of the bid falls (Miles, 1998): 0.5 per cent of bid value is not uncommon for a medium-sized bid, 1 per cent for a smaller one.

Companies involved in contested bids incur other costs too. Financial public relations consultants may be used to disparage the opposition and promote the bidder's interests: the battle for Imperial generated £1 million of fees for such PR firms. This does not include advertising costs: advertisements in just three newspapers in relation to the bids for Distillers totalled over £3 million (McPhail, 1987, quoted in Gray and McDermott, 1990). Then in some bids there are murky areas: the costs of espionage, counterespionage, bribes, intimidation, etc. (see Gray and McDermott, 1990).

The latter costs are difficult to trace: they are unlikely to be reported straightforwardly in the company's accounts. But Table 1 provides estimates from annual reports of the other, more straightforward, transaction costs incurred in a number of prominent failed U.K. bids. These represent just externally purchased services: the management time and expenses associated with the bid are included elsewhere in the accounts (and do not contribute to the accounting bias which is the subject of this paper).

The transaction costs for the unsuccessful acquirers in Table 1 range from £12 million to £50 million in absolute terms. Separate estimates by Peacock and Bannock

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[1] In this context, 'success' means just gaining control of the bid target, not, of course, the broader notions of success: that the bid adds to shareholder wealth or to aggregate economic welfare.

[2] This section relies heavily on Gray and McDermott (1990).

TABLE 1

THE BID TRANSACTION COSTS FOR FAILED BIDDERS

Bidder	Target	Transaction costs (£m)
Turner & Newall	A.E.	4.5
Elders	Allied Lyons	30
Argyll	Distillers	48
Y. J. Lovell	Higgs & Hill	2.5
United Biscuits	Imperial	21.1
Airtours	Owners Abroad	5.1
Dixons	Woolworth	11.7
Bank of Scotland	Natwest	50

Sources: Goodhart (1986), Fuller (1990), Gray and McDermott (1990), Skapinker (1993), Doran and Merrell (2000).

(1991) quoted in Singh (1992) suggest an *average* figure of 7 per cent of the bid value; Miles (1998) suggests a figure of 5 per cent; but the figure exceeds the average in the case of hostile or contested bids. In one of the world's biggest takeovers so far (RJR Nabisco Inc.) these costs are estimated to have totalled $1.2 billion (Anders, 1992).

THE ACCOUNTING TREATMENT OF BID TRANSACTION COSTS

The impact of these bid transaction costs on the bidder's reported performance in different accounting regimes can be summarized using this notation:

P = operating profit;
a = acquirer if new subsidiary (target) were not consolidated;
t = target (whether or not it is acquired by a);
P_c = combined profits of a and t: consolidated profits reported if they amalgamate; sum of independent profits if the bid fails;
y = year of takeover/merger;
TC_{aty} = transaction costs of a takeover/merger bid for company t incurred by company a in year y;
GW_{aty} = goodwill arising on consolidation of t in year y (goodwill being cash expended minus fair value of t's assets);
GW^*_{aty} = $GW_{aty} - TC_{aty}$, that is, residual goodwill after deducting transaction costs; and
n = number of years over which goodwill is amortised (if amortisation is adopted).

Using this notation, Table 2 provides a taxonomy of reported profits for the companies a and t under different accounting arrangements. Throughout Table 2 it is assumed that the underlying operating profits of the participants are unaffected by takeover: this assumption is of course unrealistic (Meeks, 1977; Ravenscraft and Scherer, 1987; Chatterjee and Meeks, 1996)—it is adopted just in order to isolate

TABLE 2

REPORTED PROFITS DEPENDING ON WHETHER A BID TAKES PLACE, WHETHER IT IS SUCCESSFUL, AND WHAT ACCOUNTING TREATMENT IS ADOPTED

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1 No bid

$$P_{cy} = P_{ay} + P_{ty} \qquad (1)$$

(a reports P_{ay})

2 Failed bid

$$P_{cy} = P_{ay} - TC_{aty} + P_{ty} \qquad (2)$$

(a reports $P_{ay} - TC_{aty}$)

3 Successful bid: acquisition accounting

(a) no goodwill write-off

$$P_{cy} = P_{ay} + P_{ty} \qquad (3)$$

(b) goodwill written off against reserves

$$P_{cy} = P_{ay} + P_{ty} \qquad (4)$$

(c) goodwill amortised

$$P_{cy} = P_{ay} + P_{ty} - 1/n\,(TC_{aty} + GW^{*}_{aty}) \qquad (5)$$

(throughout case 3, the group reports P_{cy})

4 Successful bid: merger accounting

(a) TC diminish reserves

$$P_{cy} = P_{ay} + P_{ty} \qquad (6)$$

(b) TC diminish reported profit

$$P_{cy} = P_{ay} - TC_{aty} + P_{ty} \qquad (7)$$

(throughout case 4, the group reports P_{cy})

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the impact of accounting differences, holding other things equal. Relaxing the assumption would not alter the qualitative results but it would make the presentation much more complex. Table 2 relates just to the year of merger: subsequent profits will differ from one accounting arrangement to another according to whether amortization is used.

In the following discussion and the policy conclusion, the different accounting treatments are linked to successive U.K. regulatory regimes (ASC, 1984, 1985; ASB, 1994a, 1994b, 1996, 1997); but the analysis is not restricted to U.K. arrangements—it encompasses most countries' practices, past and present, since the U.K. has at one time or another adopted each of the main accounting treatments used or considered in other jurisdictions.

Case 1 provides a yardstick: the profits which would have been reported if no takeover or merger had been mooted (P_{ay} in a's books, P_{ty} in t's). Case 2 shows the consequences of a failed bid: the reported profits of the would-be acquirer and the aggregate figure, P, are reduced by TC_{aty}, other things equal. The deadweight transaction costs flow through the disappointed bidder's profit and loss account.

If the bid is successful, however, (case 3 and case 4), combined reported profits would generally be higher than in the failure case 2. With *acquisition* (purchase) accounting and no goodwill write-off (case 3a—common pre-SSAP 22 and now available again under FRS10 subject to impairment tests), combined profits of the group would correspond to those of the no-bid case 1: TC_{aty} does not appear in the profit and loss account—it simply inflates goodwill (the difference between total cash expended, including transaction costs, and the fair value of assets acquired). The same reported profits result in case 3b, with the immediate write-off of goodwill against reserves—the most common treatment under SSAP 22 (Grinyer *et al.*, 1991); but the balance sheet is different because TC_{aty} diminishes reserves. Goodwill amortization (case 3c) presents an intermediate case between 2, on the one hand, and all the others considered so far: a portion of TC_{aty} is deducted from profits in year y; and ultimately the whole of TC_{aty} is deducted from profit. The advantage of 3c for the reporting company arises because, unlike the case of the failed bid, at least most of the effect of TC on the profit and loss account is deferred—usually for up to twenty years under current international standards.[3]

Cases 4a and 4b trace the impact of TC if *merger* (pooling) accounting is adopted. The former case relates to the SSAP 23 regime in force until 1994.[4] If the complicating effect of pre-acquisition profits is ignored, this is equivalent to acquisition accounting case 3b[5]: profits are undamaged by TC_{aty}, which instead diminish reserves. The new regime of FRS6 (ASB, 1994a, para. 19) restores neutrality in the merger case: in case 4b the combined profits of the amalgamation are the same as they would have been if TC_{aty} had been incurred but the bid had failed (case 2).[6] This is the only neutral case: a successful bid produces the same treatment of TC (equation (7)) as an unsuccessful one (equation (2)).

THE ECONOMIC CONSEQUENCES OF THE ACCOUNTING TREATMENT OF TRANSACTION COSTS

The disparate impact of transaction costs on reported profits, depending on whether the bid fails or succeeds, may affect behaviour—have economic consequences—for contracting reasons (Watts and Zimmerman, 1986) because reported profits often influence the pay and career prospects of the acquirers' managers. The use of managerial bonus plans linked to accounting profit is well documented for the

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[3] Of course, if GW is positive, reported profits will be depressed compared with case 1 or the rest of case 3.
In some cases, where impairment tests show that goodwill has not been eroded, no amortization need be charged (ASB, 1997)—a return to Case 3a.

[4] Strictly, SSAP 23 was in force until 1995: its covered year ends in 1995.

[5] Within rather permissive limits, bidders could under SSAP 23 anyway contrive to make an acquisition fit either the acquisition or the merger rubric.

[6] Except that one component of transaction costs, share issue costs connected with the merger, can still be treated as a reduction in the proceeds of the issue rather than as an expense in the profit and loss account (ASB, 1993, para. 19).

United States (see Murphy, 1985; Sloan, 1993; Indjejiklan, 1999) for reviews of bonus schemes; Healy (1985) also finds evidence that managers modify their accounting procedures to alter reported profit and take advantage of the bonus schemes); Forbes and Watson (1993) and Main *et al.* (1996) review U.K. evidence also.

As well as this widely acknowledged contracting role, reported accounting profits may have other roles too: in asymmetrically informed markets accounting earnings may be an important performance indicator in the market for executives and in the market for corporate control. For example, Weisbach (1988) finds executive dismissal decisions to have been linked to accounting performance measures; while Singh (1975) and Chatterjee (1995) find a negative relationship (albeit weak) between accounting profitability and the threat of being taken over.

In these circumstances (where managers are keen to report increased accounting profit and to avoid reductions) the role of transaction costs in distorting the incentives facing managers in the takeover process can be illustrated with the hypothetical case of a bidder at a late stage of the bidding process. Suppose the bidder is already committed to transaction costs of TC_{aty}. And consider a case where the stock market is unimpressed by the present offer: the bidder is advised that a higher offer will be necessary to secure control. Should the bidder raise the value of the offer?[7]

If the bidding manager is indeed preoccupied with reported profit, the effect of the bid outcome on that performance measure can be analysed using the formulae from Table 2. For simplicity compare two cases: case 2 (the bid fails) and case 3b (the bid succeeds; acquisition accounting is used; and goodwill is written off against reserves—the most common treatment under SSAP 22 [Grinyer *et al.*, 1991]). The same form of argument can be developed for the amortization case (3c) now favoured by the ASB and IASC: the argument becomes very much more complicated while the qualitative conclusion is unchanged. However, the size of the distortion will often be smaller because, if amortization cannot be avoided via an impairment test, the benefit in the year of merger is achieved at the expense of a cost in subsequent years. The net effect will depend on the manager's time horizon and on the discount rate (see below).

We consider three incentive schemes, each with a different performance variable affecting managers' income and/or security: the absolute level of profit, the rate of return on net assets, and earnings per share. In practice the latter is likely to be the most important in determining bonuses, in influencing share prices (and hence the value of stock options), and in triggering the grant or exercise of options (Leathley, 1999).

Just to help develop the argument, an extreme example (A) illustrates the direction of the effect we are isolating, before we introduce the extra complications needed for realism. In this example the bidder's management is assumed to be exclusively concerned with the level of reported profits; and therefore he/she will in this comparison be willing in theory to pay *any* price to secure control. This is because TC_{aty} is deducted from profits if the bid fails but not if it succeeds. This is the 'loser's curse'. And if only the absolute level of reported profits matters to the bidder's managers, an inflated premium paid to the target will not affect *their* utility, but will prevent the bid from failing, with harmful consequences for reported profit. Example A therefore yields implications consistent with the facts outlined at the beginning of the paper—large gains to the target's shareholders, but not for those of the acquirer.

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[7] From the owners' point of view, TC will hit cash flow whether or not the bid goes ahead. Here we are focusing instead on the effect on managers' utility where that depends on reported profit rather than cash flow.

Example A is, of course, based on extreme assumptions. It assumes that, for example, managers' contracts will reward them for *any* growth in profit irrespective of the increase in capital required to generate those profits. Some salary contracts have instead used the rate of return on the value of net assets as the performance indicator (example B). In these circumstances the effect on the profit *rate* of managers' paying an inflated premium for the target—in order to avoid charging TC_{aty} against profits—would depend on the accounting treatment of goodwill. In one common treatment in the U.K. in recent years (3b in Table 2) the rate of return would not be depressed by the inflated premium offered for the target: this would simply be written off in calculating the denominator of that measure. In this case, therefore, the accounting *rate* of profit would again be higher if an inflated premium were paid to secure control and bid transaction costs were kept out of the profit and loss account.

Consider now an example which at first sight might seem to avoid this anomaly: in example C the transaction costs of takeover cannot simply be eliminated from the calculation of any performance measures by treating them as one of the parts of the purchase price of the target that is written off following takeover. Take the case where the acquiring managers' utility depended on earnings per share (EPS): either the salary contract could explicitly incorporate EPS as the driving variable (see, e.g., Leathley, 1999), or perceptions of managers in the managerial labour market and the market for corporate control could be heavily influenced by this widely used summary measure. In this case the numerator, reported earnings, would still benefit from the preferential accounting treatment accorded to successful acquirers; but assume that any inflated premium paid to target shareholders would also raise the denominator and depress the acquirer's EPS—because, to finance the premium, more shares are issued. Does this more sophisticated measure eliminate any incentive to inflate the premium?

To simplify the answer, assume that, before the bid, acquirer and target enjoy the same EPS:

$$E_a/S_a = E_t/S_t \tag{8}$$

where E = total earnings
S = number of shares issued

And to make the argument as simple as possible assume that the pre-bid value of the shares of acquirer and target is identical. The bid is financed with a share for share exchange. If the bid failed, then, *ceteris paribus*, the acquirer's EPS in the bid year would be

$$EPS_{ay} = (E_{ay} - TC_{aty})/S_{ay} \tag{9}$$

EPS are depressed by having to pass TC through the profit and loss account.[8]

If X is the premium necessary to gain control of the target (which takes the form of extra shares being issued), the acquirer's (consolidated) EPS in the takeover year would be, *ceteris paribus:*

$$EPS_{cy} = (E_{ay} + E_{ty})/(S_{ay} + S_{ty} + X) \tag{10}$$

The numerator combines the two companies' earnings. The denominator shows the combination's shares after the merger is completed, and comprises three elements: the acquirer's pre-bid shares, the target's pre-bid shares (exchanged on takeover for shares in the acquirer), and the premium, representing the extra shares in the amalgamation issued to target shareholders to persuade them to accept the offer. EPS_{cy} are depressed by having to issue extra shares in order to finance the premium.

The maximum premium that would be paid for t without driving EPS_{cy} below EPS_{ay} is then given by comparing equations (9) and (10):

$$(E_{ay} - TC_{aty})/S_{ay} = (E_{ay} + E_{ty})/(S_{ay} + S_{ty} + X) \tag{11}$$

Rearranging:

$$X = [\{S_{ay}(E_{ay} + E_{ty})\}/(E_{ay} - TC_{aty})] - (S_{ay} + S_{ty}) \tag{12}$$

Plausible orders of magnitude for X can be obtained by substituting stylised facts for U.K. companies into equation (12). We have assumed for illustration that the target is one-quarter the size of the acquirer ($S_{ay}/S_{ty} = 4$ [Meeks, 1977]), transactions costs are 7 per cent of target value (Peacock and Bannock, 1991) and a not unusual earnings yield of 10 per cent is substituted for EPS. Then if the target's initial value is 100, the equilibrium value of the premium (X) is 106. In other words, the adverse effect on the acquirer's earnings per share of having to include TC in its profit and loss account is similar to that arising from a premium in the region of 100 per cent (an *extra* transfer to the target's shareholders roughly equal to the target's initial value). At first sight this may seem surprisingly large; but note that transaction costs are typically equivalent to around a year's earnings for the target (see above): a corresponding adjustment similar to the target's initial value is not then implausible.

However, the equilibrium value of X in equation (12) relates only to a single accounting year. And while the benefit to EPS of avoiding charging TC_{aty} lasts only one year, the cost to EPS of a denominator inflated by X lasts forever (the extra shares issued stay in the balance sheet). As the horizon of the manager is extended, the equilibrium value of X will therefore fall.

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[8] For simplicity we have abstracted from the mitigating effect of the tax system: TC would reduce the tax deducted in calculating earnings.

CONCLUSION

Suppose then that the acquirer's managers are able to pursue their own interests in this way: by paying extra for a target they avoid the loser's curse imposed by the accounting framework. What happens is that there is a wealth transfer from the acquirer's to the target's shareholders. Moreover the loss to the acquirer's shareholders is likely to exceed TC: in most plausible cases analysed above, the premium, X—the wealth transfer between groups of shareholders—exceeds TC.

Of course, in the examples used in this article, the acquirer's shareholders are bound by construction to suffer a wealth loss anyway, whether the bid succeeds or fails: transaction costs are incurred in making a bid but—by assumption—there is no prospect of recouping these costs because underlying performance is assumed unchanged. But will acquirers' managers wish to initiate bids which offer no performance gain? What is disturbing about these examples is that accounting considerations alone may have just that result. Not only is there a wealth redistribution among groups of shareholders but also there are implications for the economic efficiency of the takeover process. Accounting regulations have allowed the transaction costs of acquisition activity never to appear in the profit and loss account, or else to appear with a lag of up to twenty years—provided that the bid succeeds. If performance related pay is based on measures from the profit and loss account then there is a perverse incentive to complete even an unprofitable acquisition once a bid has been initiated.

It is not being suggested that this perverse incentive mechanism is the exclusive, or even principal, explanation for the puzzle we introduced in the introduction: the tendency of takeover to reduce the wealth of acquirers' shareholders. There are other hypotheses which would yield that result too. Some focus on the rapid increase in firm size for acquirers' managers; and this will be valued for its own sake (e.g., Marris, 1963), for pay increases triggered by size alone (Main *et al.*, 1996), and for increased stability arising from less volatile income streams following a diversifying merger (Prais, 1976) or from diminished risk of being taken over themselves as size increases (Singh, 1975; Chatterjee, 1995). A further hypothesis capable of yielding the same result is offered by Roll (1986), who focuses on managers' inflated expectations of their acquisition programs; and Ravenscraft and Scherer (1987) document the frequent disappointment of those expectations.

The explanation in this article shares some features of these hypotheses, especially a focus on the options and incentives facing managers; and in some cases our explanation might combine with these other motives to produce takeovers which, from the shareholders' point of view, would have been better abandoned. Our explanation focuses on the interplay of managerial motives with the accounting numbers used in managers' explicit or implicit contracts with their principals. Within this contracting framework, accounting disclosures prescribed by some reporting regimes have been shown to bias investment decisions taken by managers on behalf of their principals, the shareholders.

How can this potentially costly anomaly be removed? One possibility would be to disentangle managers' pay from accounting measures of performance—for example, by relating pay to stock market returns instead. But this solution has at least two potential drawbacks. First, while the work of, say, Hong *et al.* (1978) suggests that the stock market effectively sees through the accounting manipulation that has been reviewed here, this is not universally agreed (Robinson and Shane, 1990; Zeff, 1992): the same anomalies may be reflected in share prices. And secondly, even if the market is not fooled by the manipulation, there are well-established problems in linking executives' pay to stock market returns when these latter returns are themselves very 'noisy' indicators of executive performance (Sloan, 1993; Lambert, 1993; see also Eggington *et al.*, 1989). Perhaps it is because of such problems of noise that the granting and/or exercise of share options is itself often tied to accounting measures of performance (Leathley, 1999), and that executive dismissal decisions have been found to be linked to accounting performance measures (Weisbach, 1988).

Their pervasive influence on pay and security would therefore confirm the argument for improving accounting measures of performance. And in the case of the anomaly being considered here, a suitable improvement would be to require the transaction costs of takeover to flow through the profit and loss account for a successful bidder under *acquisition* accounting just as they do under *merger* accounting or for the unsuccessful bidder. Then the loser's curse should not distort economic decisions on takeover. It is an irony that merger accounting, which is free of the distortion analysed in this paper, has been banned in Australia (Tweedie and Whittington, 2000), is likely soon to be banned in the U.S. (Jenkins, 2000) and quite probably by the rest of the 'G4+1' group (ASB, 1998).

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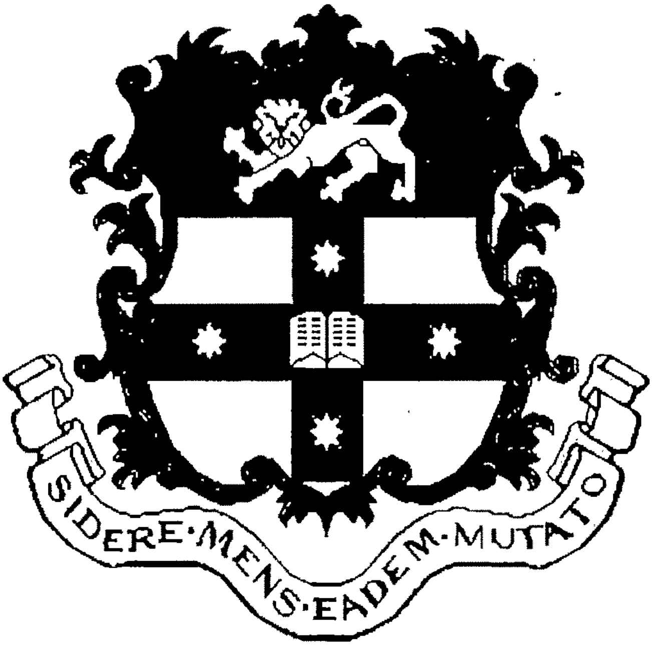

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